THE UNIVERSITY OF ALBERTA

Alberta's Beef Industry Year 2000

by

Jaroslaw P. Nowak

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IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Alberta's Beef Industry Year 2000 submitted by Jaroslaw P. Nowak in partial fulfilment of the requirements for the degree of Master of Science in Agricultural Economics.

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Date....July 7/87..........

DEDICATION

This work is dedicated to my mother Natalia; and in memory of my father Jozef

ABSTRACT

This study was undertaken in order to predict the state of Alberta's beef industry in the year 2000 and to identify policies which would assure viability of this industry.

A literature review of recent studies on the design and application of the Delphi method is undertaken. Furthermore, the main results and recommendations of selected studies concerned with the beef industry, carried out on national and provincial levels, are presented.

The main objectives of the study were met through systematic questioning of the industry experts and the analysis of their opinions and predictions. The Delphi approach which consisted of three questionnaires was a primary methodology utilized in this study. The questionnaires were sent to the panel of experts selected through the nominating process. Members of the panel of experts represented such groups of interest as, producers, processors, retailers, consumers, and government employees.

The study led to a number of observations and conclusions which are presented throughout Chapters V to VIII of this thesis. Finally, the set of recommendations was established. Selected recommendations, related to the study results, are listed below.

1. The optimism of the panel of experts about the future of Alberta's beef industry is based upon assumptions that federal and provincial government actions will not lead to a further distortion of marketing signals and will

not inhibit comparative advantage of Alberta's beef industry. Therefore, the government of Alberta should realize that, in order to enjoy the economic activity generated by beef production, its assistance in ensuring the competitiveness of the provincial beef industry is essential.

2. The sales of beef products has suffered from a widespread consumer belief that beef is not as healthy as other meats. Therefore, a further support in presenting to the public medically correct information about beef as a food is needed.
3. The beef industry, in general, has exhibited a slow tempo of adoption of new technology. An improvement in technology transfer and assistance in the development of consumer oriented products are needed.

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I. INTRODUCTION

A. BACKGROUND

The beef industry and its companion enterprises operate within a business environment which is changing with time. The business environment is a composition of competitive, technological, economic, cultural, social, and political and legal environments. Most of these elements are beyond the control of decision makers at the firm or industry level.

The majority of enterprises in any industry are in business with the intention of continuing their operations in years to come. That desire is manifested by such factors as substantial capital investment, responsibility to shareholders or the want of obtaining adequate return on time and money invested. Despite the fact that these factors can vary from firm to firm or from industry to industry, one thing appears to be unchangeable; without a sound strategic plan based on an adequate forecast, that desire more than likely will be not fulfilled. Therefore decision makers spend a considerable amount of time and effort in anticipating future changes. In this regard, questions concerning future demand for the product including; changes in consumer desires, changes in geographical locations of input and product markets, level of economic activity, and level of competition from domestic and foreign enterprises; belong to the group of questions most often asked when strategic planning takes place.

Technological changes and their importance in the improvement of competitiveness within the same industry or among industries is an important consideration in planning for the future. The adoption of technological changes in the form of a new product or improvement of an enterprises operation can often decide which firms or industries will be successful in the future and which will lose their importance.

Finally, the economic environment is more and more altered by the political and legal environment in the form of policies introduced by provincial and federal governments. Voting groups exercise their power in order to affect or invoke government programs/policies for their advantage. However, not all groups exhibit the same potential for persuasion and as a result, some groups are losers and others are winners in this exercise of political influence. Therefore, prediction of future government programs is also an important element of strategic forecasting.

The ultimate objective of the study was to create an overview of the beef industry during the next decade and to establish a list of programs and policies which are required by this industry. The obtained forecast would allow firms to understand the implications of alternative courses of action.

B. STUDY OBJECTIVES

The main objectives of the study are outlined below:

1. To predict the changes in absolute and relative levels of beef consumption.
2. To forecast changes in importance of the beef industry at the farm level.
3. To estimate possible changes in the contribution of Alberta to the national beef industry.
4. To predict changes in geographical distribution of cattle finishing and slaughtering within Alberta.
5. To establish the list of possible technological changes in the beef industry and rate them for their importance and likelihood of occurrence.
6. To develop a list of government programs and policies required by the beef industry and evaluate them for their desirability and ease of implementation.

All objectives listed above apply to the next 14-15 years. As a result, this thesis is entitled "Alberta's Beef Industry Year 2000." Additionally, it is hoped that the study and its results will stimulate other researchers in the agricultural field to look at the Delphi method as an alternative research technique available to them in forecasting future events and dealing with policy problems.

C. METHODOLOGY

The study adopts the Delphi method. Delphi may be characterized as a method for structuring a group communication process. This procedure is effective in allowing a group of selected individuals, as a whole, to deal with complex problems[1]. In the most common version of the Delphi method, referred to as a Delphi Exercise, a questionnaire is designed and sent to the chosen respondent group. Responses to that questionnaire are analyzed and new questionnaires with enclosed feedback are sent to participants. The respondent group, often referred to as a Panel of Experts, is given at least one opportunity to reevaluate its original answers based upon examination of the group responses.

" To a degree, this form of Delphi is a combination of a polling procedure and a conference procedure which attempts to shift a significant portion of the effort needed for individuals to communicate from the larger respondent group to the smaller ..."[2] designing and monitoring group. Delbecq[3] described this method as a method for systematic solicitation and collation of judgements on ~~a~~ particular topic through a set of carefully designed sequential questionnaires, interspersed with summarized information and feedback of opinions derived from earlier responses.

---

[1] Linstone, Harold A. and Turoff, Murray, 1975, *The Delphi Method Techniques and Applications*, Addison-Wesley Publishing Company, Massachusets, p. 3.

[2] Linstone and Turoff, 1975, p. 5.

[3] Delbecq, Andre L. and Van de Ven, Andrew H. and Gustafson, David H., 1975, *Group Techniques for Program Planning, A Guide To Nominal Group And Delphi Processes*, Scottf, Foresman and Company, Glenview, Illinois, p. 10.

A series of three questionnaires mailed to the panel of experts was applied in this particular study. Information included in the first questionnaire was gathered from primary and secondary sources, which are cited. The remaining two questionnaires are entirely based upon information derived from the previous questionnaires. A detailed description of the study design is presented in Chapter IV and the limitations of the methodology are stated in Chapter III.

D. ORGANIZATION OF THE THESIS

Chapter II utilizes available information in order to provide a short overview of importance and structure of the beef industry in Alberta.

Chapter III reviews the application of the Delphi method and presents results of previous studies concerned with the beef industry at provincial and national levels.

Chapter IV discusses the design of the study and methods of analyzing responses generated through sequential questionnaires.

Chapter V provides the forecast of changes in selected aspects of Alberta's beef industry and a list of underlying assumptions rated for their importance and likelihood of occurrence.

Chapter VI presents anticipated technological changes and summarizes the respondents ratings of the importance and likelihood of occurrence of these changes.

Chapter VII provides a list of government programs and policies rated by industry representatives as desirable and feasible.

And finally, Chapter VIII presents a summary and conclusion with recommendations that were formulated during this study. The main stages of the project and chapters related to these stages are outlined in Figure I.1.

Figure I.1. Project Process Flow Chart, Alberta, 1986

1. Preparation Stage:
    - Determination of the problem and objectives of the study (Chapter I)
    - Literature review (Chapters II and III)

↓

2. Selection of Participants (Chapter IV)

↓

3. Data Collection Process (Chapter IV)
    - Designing individual questionnaires
    - Editing of responses
    - Conducting intermediate analysis

↓

4. Final Analysis of Results (Chapters V, VI, and VII)

↓

5. The Summary (Chapter VIII)

II. ALBERTA'S BEEF INDUSTRY - ITS IMPORTANCE AND STRUCTURE

A. ITS IMPORTANCE

The Alberta beef industry is a diverse system that plays a major role in the provincial economy. Cash receipts at farm level from the sale of cattle and calves are first in importance, averaging close to 30 percent of the total farm cash receipts in the last decade[4]. Those receipts amounted to 1.2 billion (bln) dollars in 1985. Furthermore, in the following three census years, 1971, 1976 and 1981, cattle were reported on 37.8, 37.6 and 31.5 percent of all farms with sales of 2,500 dollars or more, respectively[5]. These statistics show that the cattle industry is the most important segment of the Alberta agriculture.

The importance of Alberta's beef industry in the national context can be presented best by comparison of Alberta's share in the Canadian human population, to Alberta's share in the national cow herd, and the number of finished and slaughtered cattle. Whereas only 9 percent of Canadians[6] live in Alberta, around 40 percent of the Canadian cow herd, finished cattle herd and cattle slaughtering is located in this province.

---

[4] Alberta Agriculture, *Agriculture Statistics Yearbook*, Editions published between 1972 and 1985, Print Media Branch, Edmonton.

[5] Statistics Canada, *Census of Canada*, Years: 1971, 1976, and 1981, Catalogue 90-910, Ottawa.

[6] Statistics Canada, 1984, *Canadian Statistical Review*, Catalogue 11-003E, Ottawa.

The production of cattle results in a substantial domestic multiplier because of investment and employment in ancillary industries. While this includes the input industries the multiplier effect is likely most dramatic in the slaughtering and processing sectors. Devine suggests that "... four to one multiplier effect is characteristic of the livestock industry ..."[7]. That means that one dollar of sales in the primary industry, e.g. cattle production, generates four dollars in sales in ancillary industries.

The meat packing industry is the largest food processing industry, accounting for more than 50 percent of the total value of shipments of the food and beverage industry. The value of shipments for the meat packing industry reached 1.9 bln dollars in 1984[8], with beef contributing almost 70 percent of the volume output from the packing industry[9]. Additionally, the Alberta meat processing industry provides over 5,000 jobs[10], making it one of the largest employers and the leading manufacturing industry in the province.

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[7] Devine, D. G. and Williams, C. M., 1977, *A Summary Report of The Meat-Grain Interface Project*, Department of Agricultural Economics, University of Saskatchewan.

[8] Alberta Agriculture, 1985, *Agriculture Statistics Yearbook*, Print Media Branch, Edmonton.

[9] Based on slaughter volume available from such Statistics Canada publications as, *Livestock and Animal Products Statistics* (1985) and *Production of Poultry and Eggs* (1985).

[10] Agriculture Canada, January 1983, *Handbook of the Food Processing, Distribution and Retailing Sectors.*

B. ITS STRUCTURE

The beef industry consists of numerous participants who interact simultaneously or in sequence over the time needed to convert beef calves into ready consumer products. Figure II.1 presents a simplified version of the Alberta beef industry system. The first sector, producers, can be divided into two main subsectors: cow-calf and feedlot operators. Beef production starts as a calf on the farm of the cow-calf operator. The average size of cow-calf enterprises is relatively small, with 55 percent having fewer than 33 cows[11]. Cow-calf operations are rarely the sole income of producers. They rather constitute supplementary production utilizing marginal land. Calves are normally weaned at about six months of age and the finishing process can take the form of combinations of high energy and/or high forage feeding. The majority of cattle are placed on high energy ration in feedlots till they obtain slaughter weight. Some cattle can be first backgrounded before they are placed in feedlots, and small numbers attain their slaughter weight on forage based rations. These numerous alternatives lead to a situation where cattle can change ownership 2-3 times before slaughter, and age at slaughter can differ considerably among animals.

Animals can be sold through many different channels such as, country auctions, terminals, or directly to packers

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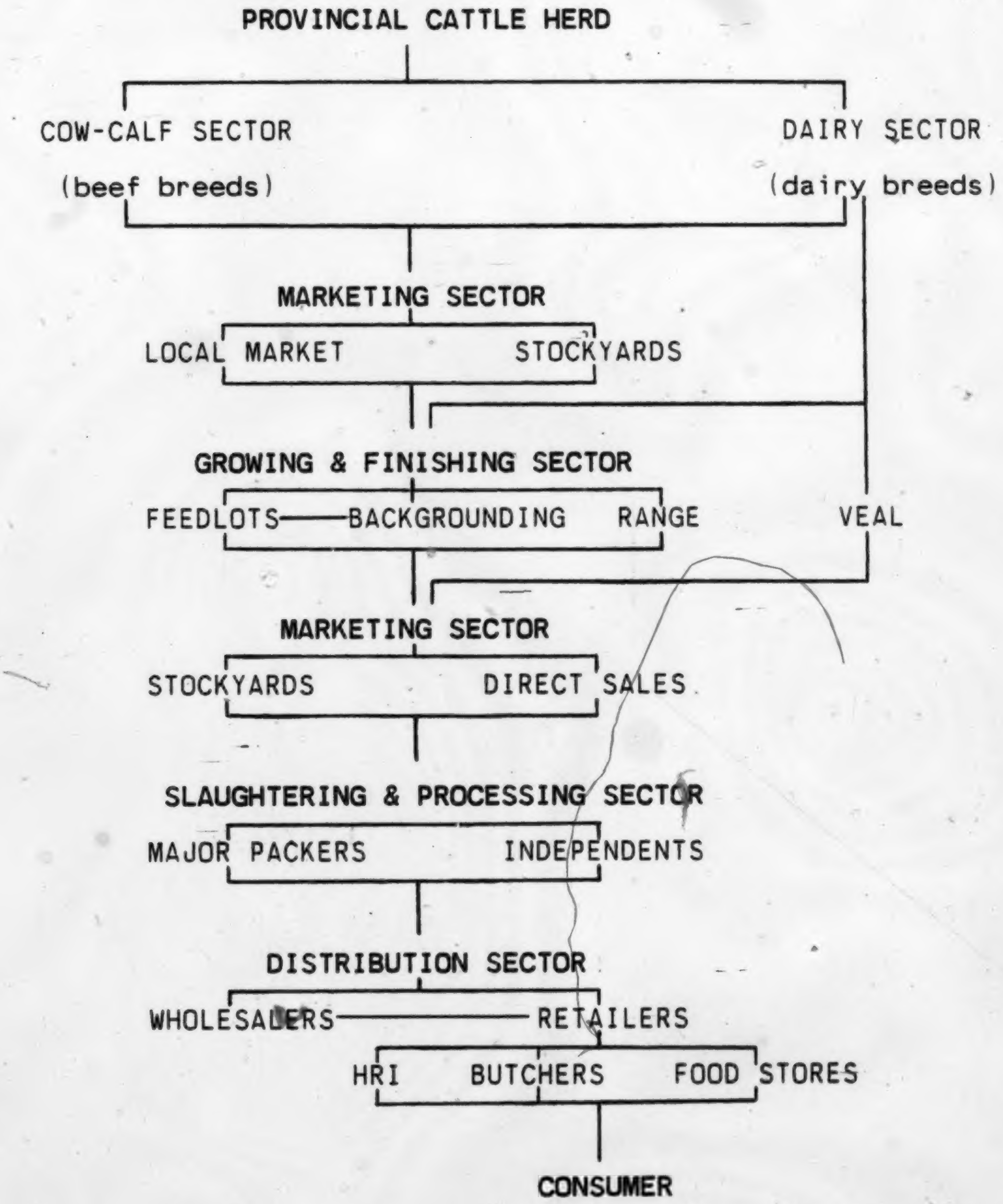
[11] Canada Statistics, *1981 Census of Canada*, Special request (farms reporting beef cows classified by number reported) for Statistics Branch, Alberta Agriculture.

Figure II.1. The Structure of the Alberta Beef Industry, Alberta, 1986



on liveweight or railgrade basis. Country auctions are the most utilized channel for sales of feeder cattle, whereas direct sales to packers dominate the sales of slaughter cattle.

Slaughter animals are sold to packing plants or slaughtering houses which transform cattle into carcass beef. Furthermore, this sector produces and processes by-products from the slaughter process. There are around 50 packing plants and slaughtering houses in Alberta[12]. Almost all cattle are slaughtered in federally inspected plants[13]. Meat packers can be divided into two groups which differ greatly in size: the major packers and the independents. Major packers, such as Canada Packers Ltd., and Intercontinental Packers Ltd. are large multi-plant firms which tend to be vertically integrated into processed, branded meat products and by-products. The independents are generally one plant firms concentrating on animal slaughter. The majority of cattle are slaughtered in plants owned by the major packers[14]. Products leaving the packer's cooler can differ greatly among different packers according to the level of processing which took place in a plant. It can enter the market as unprocessed carcass at one extreme or as subprimal or consumer ready cuts, or final product at another.

---

[12] Alberta Agriculture, Agricultural Processing Development Branch, 1984, *Directory of Alberta's Agricultural Processing Industry*, Edmonton.

[13] Based on national numbers, after accounting for import and export of slaughter cattle, obtained from *Livestock and Animal Products Statistics*, Statistics Canada, 1985.

[14] Commission of Inquiry into The Marketing of Beef, 1976, *Report of The Commission of Inquiry into The Marketing of Beef and Veal*, Minister of Supply and Services Canada, Ottawa, p. 20.

The next and last sector of the beef industry is the retail segment. Retailers can be connected with meat packers through independently-owned wholesalers and purveyors. However, in most cases wholesaling activities are integrated forward by meat packers or backwards by retailers. In Alberta the majority of retailers are serviced with carcass, primals or boxed beef shipments, directly from packing plants. The exception is Canada Safeway Ltd. which services stores with boxed beef from its own processing plant, Lucerne Foods Ltd., based in Calgary. Retailers represent the link between the beef industry and the consumer. Three basic types of retailers can be distinguished , HRI (hotel, restaurant and institutional outlets), independent butchers and retail food stores. The majority of beef is sold through retail food outlets, which can be grouped into three organizational categories: corporate owned chains, voluntary chains, and individual independent stores. Corporate owned chains are the biggest distributor of consumer ready beef in Alberta.

The description of the Alberta beef industry presented above was designed to supply the reader with a brief background information. For a detailed description of the industry, the reader is advised to refer to references cited in the bibliography.

III. LITERATURE REVIEW

Chapter III consists of two main parts. The first part, discusses the evolution and applications of the Delphi method. Furthermore, a set of recommendations addressed towards new users is presented. The second part of the chapter presents a review of the main studies carried out previously on the national and provincial beef industry.

A. APPLICATIONS OF DELPHI METHOD

Introduction

The Delphi method has been employed for different purposes ranging from a technological forecast to policy problems and as a result many modifications of this method have been established. However, the main characteristics of the method based upon sequential questionnaires or computer interactions interspersed with summarized information and feedback of opinion derived from earlier responses, have remained unchanged.

The Delphi process was developed by Dalkey and his associates at the Rand Corporation in the early 1950's. The first applications of the method were in the field of defense research. It took a decade before the Delphi method found any applications for civilian purposes. Gordon and Helmer in their paper[15], "Report on a Long-Range Forecasting

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[15] Rand Paper P-2982. Most of the study was later incorporated into Helmer's *Social Technology*, 1966, Basic Books, New York.

Study", from 1964 applied the Delphi method to assess "... the direction of long-range trends, with special emphasis on science and technology, and their probable effects on our society and our world".

Originally the Delphi technique evolved as a forecasting tool to deal with technical topics and seek a consensus among homogeneous groups of experts. In 1970 Turoff introduced and reported on the use of the Delphi method to formulate policy problems. That technique, on the contrary, seeks to induce the strongest possible opposing views on the potential resolutions of a major policy issue. Linstone and Turoff describe a policy view as one "...for which there are no experts, only informed advocates and referees"[16]. These two main streams of the utilization of the Delphi technique, forecasting and policy, and many combinations of the two approaches continued to be used. In the following parts of this section the reviews of selected studies representing each type of the Delphi method are presented.

Forecasting Delphi

Forecasting Delphi is based upon the Lockean Inquiring System[17]. The philosophy of Locke states that the truth is experimental and therefore the truth of the model does not rest upon any theoretical considerations. The data input sector is not only prior to the formal model (theory) but it is separate from it as well. In the Delphi method, opinions of the experts constitute the data input sector and the degree of consensus is a measure of the validity of those opinions.

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[16] Linstone and Turoff, 1975.
[17] Linstone and Turoff, 1975, p. 21-23.

The study presented below, "A Delphi Exploration of the U.S. Ferroalloy and Steel Industries" was conducted by Goldstein and Turoff in 1970[18]. The Delphi method was applied as a means of assessing the implications of technological change on usage trends of ferroalloys. The study consisted of three rounds of interrogation. Respondents were carefully selected by the initial panel and represented such sectors of the industry as, government, universities, institutes, and trade publications. One hundred people were chosen to the initial panel and thirty-three of them participated in the first round. Each round questionnaires were divided into three sections; Section I, Steel; Section II, Alloys; and Section III, Key Developments. The first two sections presented graphs covering various aspects of the steel industry. Each graph outlined a continued trend line usually running from 1960-69 and respondents were asked to extend the line through to 1985. Each graph was supplemented by three questions; 1) How reliable did the respondent consider his graph extension to be ?; 2) What key assumptions did the respondent assume in making his extension?; and 3) What other developments might result in major revisions in the extension?.

---

[18] Goldstein, Nancy H. and Turoff, Murray, 1971, *A Delphi Exploration of the U.S. Ferroalloy and Steel Industries*, NMAB-272, National Technical Information Services, Springfield.

Section III consisted of blank graph sheets and a blank key development table for respondents wishing to add to items presented in Section I and II.

All comments were collected, edited and grouped in one of four categories: Forecasting Assumptions, Economic and International Considerations, Key Developments or Comment Associated with a given graph. A fifty percent limit established by low and higher quartiles was calculated for each of the extension lines.

Results from the first questionnaire were used to create a second round questionnaire. Respondents were asked to evaluate assumptions for their validity, likelihood of occurrence and/or nature of impact on the steel industry if the development were to occur. Choice of rating scale to be used was dependent upon the category the assumption belonged to. Furthermore, respondents were presented with graphs containing a 50 percent limit and asked to reestimate their previous extension.

Thirty-four respondents completed the second questionnaire and new 50 percent confidence limits were calculated for the graphs. Additionally, standard deviations, means and percentage distribution of responses under each of the applied scales were calculated.

In the last round questionnaire, the first two sections were used for summary purposes, and only the third section required an input. Respondents were asked to reevaluate all key developments and those assumptions which exhibited a large standard deviation.

The study was conducted over the period of 46 weeks and consumed additional 53 weeks of work.

Policy Delphi

The policy Delphi reflects the Dialectical inquiring system in which truth is treated as conflictual[19]. The data input sector is meaningless by itself, unless it is coupled to the plan and counterplan. The communication process in the policy Delphi is designed to produce pro or con arguments associated with various policies. The policy Delphi is, therefore, a tool for the analysis of policy issues and not a mechanism for making a decision.

The study conducted by Phillips, Beck and Lamble in 1984[20] was selected for the presentation of a policy Delphi design. The main objective of the study was to identify and define forest economic research needs in the West Central region of Canada. The study design employed two research techniques, the Delphi method and workshop format meetings.

The Delphi method in the form of three sequential questionnaires was applied in order to fulfill the following three objectives:

1. To identify existing research activities.
2. To define forest economics research needs.

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[19] Linstone and Turoff, 1975, p. 29-33.

[20] Phillips, William, James Beck and Wayne Lamble, 1984, *Forest Economics Research Needs for The West Central Region of Canada*, Northern Forest Research Centre, Edmonton.

3. To define the gap between the activities and research.

The Delphi method was supplemented by four area meetings using a workshop format in order to identify constraints in meeting research needs and to strengthen a sense of community among the participants and users of forest economics research.

Questionnaires were mailed to a sample of 88 and consisted of leading forest economic researchers and research users, selected through a peer nominating process. First round questionnaires consisted of a number of open-ended questions. Respondents were asked "... to list the important forest economic research needs, topics or questions they felt should be addressed for the West Central Region of Canada and to briefly state their reason for each item listed"[21]. The second question concerned existing relevant research projects and in the third question respondents were invited to comment on four criteria and to assign an importance score to each criterion in evaluating and rating forest economics research needs. The final question asked respondents about their professional role in terms of geographic area and type of employment.

Seventy-seven questionnaires were received for editing and analysis. A list of 26 major headings was developed with respect to proposed research needs. From four criteria (urgency, expected benefits in relation to costs, potential for contribution to knowledge, and relevance to provincial, regional, or national goals for forestry) presented to respondents two were chosen, urgency and importance, for rating the identified needs in the second round. Responses to questions concerned with the professional role of the respondent were used to establish a cross-tabulation for subsequent rounds.

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[21] Phillips, Beck and Lamble, 1984, p. 8.

The second round questionnaire contained proposed research needs summarized into 26 headings. The respondents' task was to comment on each of the research needs and to rate it for its importance and urgency. Sixty-nine questionnaires were returned and analysis focused on establishing preliminary priorities among items and summarizing comments. The third round offered respondents an opportunity to review once more prior responses and to express their individual judgements as to the importance of each item.

As a result of the use of the Delphi method all three objectives stated above were satisfied. A comprehensive list of past and current forest economics research activities and a list of 26 major research needs were assembled.

Summary and Recommendations

The Delphi method is quite a new item on the menu of research tools. It offers a researcher an opportunity of conducting controlled and structured utilization of experts' opinions, without requiring that participants meet face to face. Delphi allows respondents to remain anonymous and prevents domination by individuals. It can be applied to aggregate judgements in situations where some respondents or groups of respondents are hostile toward one another.

The Delphi has been applied in many different areas and the purposes of the method are as varied as the users.

Linstone and Turoff published in 1975 a comprehensive study of the Delphi method in which they discussed philosophical and theoretical basis for the Delphi method and reviewed its development. Furthermore, using previous experience with Delphi they established a set of recommendations for a prospective user (some of them are presented below). According to Linstone and Turoff, a researcher should consider the Delphi method in one of the following situations:

- The problem does not lend itself to precise analytical techniques but can benefit from subjective judgements on a collective basis.
- The individuals needed to contribute to the examination of a broad or complex problem have no history of adequate communication and may represent diverse backgrounds with respect to experience or expertise.
- More individuals are needed than can effectively interact in a face-to-face exchange.
- Time and cost make frequent group meetings infeasible.
- The efficiency of face-to-face meetings can be increased by a supplemental group communication process.
- Disagreements among individuals are so severe or politically unpalatable that the communication process must be refereed and/or anonymity assured.
- The heterogeneity of the participants must be preserved to assure validity of the results, i.e., avoidance of domination by quantity or by strength of personality ("bandwagon effect")[22].

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[22] Linstone and Turoff, 1975, p. 4.

They as well argued that the Delphi method is not an easy concept to work with as it seems on the surface and researchers should be aware that misuse of the method will lead to failure. The most often reasons responsible for failure are as follows:

- Imposing monitor views and preconceptions of a problem upon the respondent group by overspecifying the structure of the Delphi and not allowing for the contribution of other perspectives related to the problem.
- Assuming that Delphi can be a surrogate for all other human communications in a given situation.
- Poor techniques of summarizing and presenting the group response and ensuring common interpretations of the evaluation scales utilized in the exercise.
- Ignoring and not exploring disagreements, so that discouraged dissenters drop out and an artificial consensus is generated.
- Underestimating the demand nature of a Delphi and the fact that the respondents should be recognized as consultants and properly compensated for their time if the Delphi is not an integral part of their job function[23].

B. STUDIES CONCERNING THE BEEF INDUSTRY

The early seventies brought two major international price shocks which together with domestic factors induced a high level of inflation in Canada. In 1972 and 1973 several factors, e.g. large purchases of grain by the Soviet Union and crop failures around the world, resulted in acceleration of wheat and feed grain prices. In 1973 the Organization of Petroleum Exporting Countries (OPEC) decided to increase crude oil prices[24]. Beef producers were faced with diminishing demand for beef, lower prices for their product and increasing costs of production. Furthermore, the situation was aggravated by the beef cycle. As a result, the number of farm bankruptcies rose. Difficulties in the beef sector did not miss the processing sector, which also suffered financial hardships. Those trends continued through the seventies and early eighties.

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[23] Linstone and Turoff, 1975, p. 6.

[24] Jump, G. and Wilson, T., 1976, "Macroeconomic Effects of the Energy Crisis 1974-1975", Institute for Quantitative Analysis, University of Toronto, Series No 76.

A number of studies concerned with finding the solution to problems faced by the beef industry were initiated. This next section contains reviews of several national and provincial research projects.

Commission of Inquiry into the Marketing of Beef and Veal

The study conducted by the Commission[25] centered its attention on effectiveness of the existing marketing system and on the determination of a marketing structure for beef and veal which would best serve the interest of producers and consumers alike.

The Commission's final conclusions and recommendations explored alternative marketing techniques, marketing systems for beef and other food products both in Canada and abroad. Additionally, existing provincial and federal government services and policies and their influence on the marketing structure were examined.

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[25] Commission of Inquiry into The Marketing of Beef, 1976, *Report of The Commission of Inquiry into The Marketing of Beef and Veal*, Minister of Supply and Services Canada, Ottawa.

Among government policies analyzed by the Commission were such policies as, commercial, transport, stabilization and income tax. Furthermore, discussion and analysis of government services and regulations took place. The list of recommendations concerned with health inspection, the market information system (its consistency, adequacy, accuracy), auction and railgrading standards, and regulations connected with marketing of subprimal cuts were established as a result[26].

The Standing Senate Committee on Agriculture

The Standing Senate Committee on Agriculture began its study of the Canadian beef industry in 1976. The Committee held a number of hearings across the country. Consultants were contracted to examine the structure and the operation of the beef industry. Their work resulted in a Working Paper entitled "Alternative Marketing and Stabilization Programs for the Beef Industry in Canada". That paper was designed to identify issues and to propose options for the industry as a means of encouraging discussion of producer and industry problems. Opinions of wide selection of people representing producers, consumers, government officials, academics and other groups were collected and analyzed.

In drawing final conclusions the Committee recognized two following principles:

1. Canada must have a strong and viable beef

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[26] Appendix A contains the list of conclusions and recommendations established by The Commission of Inquiry.

> industry. The benefits this industry generates for all Canadians are significant. The lost revenues and unutilized resources resulting from a weakened beef industry would be a great economic and social cost to Canada.
>
> 2. Beef industry policy approaches must be flexible and developmental. This is necessary so as to provide a combination of approaches which encourage the improvement of the existing institutional framework, and measures which foster the longterm viability of the beef industry, in ways which achieve general acceptance on the part of beef producers[27].

The six-year study resulted in two reports. The first report, entitled "Recognizing the Realities: A Beef Import Policy for Canada", presented ways of moderating the impact of external market forces on the Canadian beef industry.

The Committee made the following six recommendations[28]:

1. Canada should adopt a long term beef import policy and Parliament should enact legislation to regulate the importation of beef, veal and live cattle for slaughter.
2. The legislation regulating the importation of beef, veal and live cattle for slaughter should provide for the establishment of annual quotas based on the average imports in past.
3. Tarrifs on import of beef, veal and live cattle for slaughter should be increased in order to compensate for higher cost of production in Canada.
4. The legislation regulating import should provide for

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[27] The Standing Senate Committee on Agriculture, 1982, *Industry in Turmoil: Report on The Long Term Stabilization of The Beef Industry in Canada*, Minister of Supply and Services Canada, Ottawa, p. 4.

[28] The Standing Senate Committee on Agriculture, 1977, *Recognizing The Realities: A Beef Import Policy for Canada*, Minister of Supply and Services Canada, Ottawa.

additional duties when domestic prices for manufacturing and butcher beef fall below price level established in relation to existing beef stabilization programs.

5. Maximum guide price should be established to protect consumers and the annual import quotas should be increased when Canadian market price rises to the guide price level.
6. Canadian government should try to amend Article XI of GATT to provide for the adoption of quantitative restrictions when government measures are taken to stabilize the supply of agricultural commodities and to provide for the assurance of compatible market access through market shares based on typical historical patterns.

That study played a role in the enactment of the Meat Import Act in 1981, which however differed from the format proposed by the Committee.

The second report, "Industry in Turmoil: Report on the Long Term Stabilization of the Beef Industry in Canada", was published five years later in 1982.

Main conclusions drawn in that report were as follows:

1. Ad hoc programs dominated government actions in the beef industry. A national program not duplicating provincial initiatives and not distorting rational economic basis is needed.
2. The long term income stabilization program at a level of support viewed by producers to be worthwhile and

appropriate would be a production incentive and therefore is not acceptable.

3. "There appears to be a lack of market information for many small producers who collectively form an important source of beef supplies."[29]
4. The evaluation of grading system should take place and required changes should be implemented as soon as possible.
5. "Importance of developing a stable, profitable and large domestic market should be not overriden by the desire to establish export markets."[30]
6. National Beef Producer Agency without quota and/or price setting power should be established.
7. Option of establishing income averaging program which would create a capital pool for beef operation financing at favourable interest rates should be considered.

C. OTHER STUDIES

Anderson and Vandermeulen submitted a report "An Evaluation of the Cattle/Beef Industry in Canada", to the Minister of Agriculture in 1982.[31]. The report contained an evaluation of the attitude of producers and representatives of the beef industry to the free market, technical marketing improvements and different marketing systems for beef cattle.

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[29] The Standing Senate Committee on Agriculture, 1982, p. 9.
[30] The Standing Senate Committee on Agriculture, 1982, p. 5.
[31] Anderson, E. H. and Vandermeulen, H. M., 1982, *An Evaluation of The Cattle/Beef Industry in Canada*, A Report Submitted to Agriculture Minister Eugene F. Whelan.

Marketing inefficiency, market customs, inadequate market information and price discovery mechanism, and an imbalance in bargaining power were cited as reasons for a decline in producers income. The authors argued that planned production and marketing could remedy the weaknesses of the system and indirectly support producers' income. Therefore, the establishment of a Canadian Red Meat Commission and tripartite national stabilization program were the most important among the recommendations presented in the report. According to Anderson and Vandermeulen, the Canadian Red Meat Commission should have control over cattle and beef produced, imported, transported and sold in Canada. The Commission would be responsible for establishing a central marketing mechanism at two levels; one between producers and packers, and the other between packers and retailers. Collection of levy, negotiation of minimum prices, monitoring of the system, imposing of penalties would be some of the other responsibilities of the Commission. In a situation when a full-fledged planned production and marketing program could not be established the authors recommended a voluntary national tripartite stabilization program involving the federal and provincial governments and producers.

The studies concerned with the beef industry at a national level were supplemented by a number of projects directed at specific problems of different regions. The study conducted in 1985 by Marv Anderson and Associates Ltd.[32] for Agriculture Canada is one of them.

The main purpose of that study was to identify and analyze historical productivity changes in the Alberta beef industry, in order to forecast possible productivity changes in the next 15 years. As a result, a list of suggestions for policy and program initiatives for fostering improved productivity in the Alberta beef industry could be established.

Quantitative analysis was applied to develop an assessment of the historical and project future productivity changes in the Alberta beef industry. It was estimated that the rate of technological change averaged about 1 percent per annum for the period 1960-1983. Increased size of operations in South and Central Alberta, improved reproductive efficiency, improved health and nutrition, and improved management were cited as the most important sources of that technological change. The authors argued that changes in farm structure, improved reproductivity, and improved health and nutrition would be responsible for most of the technological gains taking place till the year 2000. A widespread adoption of available technology rather than major technological breakthroughs was expected. The estimated level of productivity gains was at 0.75 percent per annum for the period 1985-2000.

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[32] Marv Anderson & Associates Ltd., 1985, *Impacts of Technological and Economic Changes on Productivity In The Alberta Beef Industry*, Prepared for Agriculture Canada, Regional Development Branch, Edmonton.

Finally, the report contained policy suggestions grouped into four subject subgroups: Marketing, Industry Incentives, Producer Technology and Basic Research. The main suggestions of the study were as follows[33]:

1. Marketing
   a. Create expanded and effective beef marketing program.
   b. Guarantee access to the U.S. markets and consider an industry operated export agency.
   c. Improve public understanding of the beef industry.
2. Industry Incentives
   a. Changes in the Domestic Feed Grain Policy are needed in order to ensure stable supplies and prices for grains within Western Canada.
   b. Tax incentives leading to increased investment in livestock production and processing should be implemented.
   c. The role of cattle in soil conservation should be recognized.
3. Producer Technology and Basic Research
   a. Improve methods of technology transfer.
   b. Analyze investment in technology adoption by using benefit-cost analysis.
   c. Support basic research due to its high benefit-cost ratio.

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[33] Marv Anderson & Associates Ltd., 1985, p. 149-153.

D. SUMMARY

The objective of this chapter was to present the reader and the author with background information for both the study design and type of problems faced by the beef industry.

In the first part of this chapter attention was focused on the evolution of the Delphi method. The reviews of two studies representing two different types of Delphi were used to outline some differences in inquiring system and design of forecasting and policy Delphi. As well, a set of recommendations regarding the application of the Delphi method established by previous users was presented. That part of the literature review played a role in designing the research project for this study. A combination of policy and forecasting Delphi was chosen in order to meet the objectives outlined in Chapter I.

The second part of this chapter reviewed some of the most important studies carried out on the beef industry and its problems. Some problems presented changed over time, some were resolved and some still exist. However, the complexity of the subject is unchanged. This part of the literature review facilitated the understanding of the beef industry and its challenges, helping in the selection of objectives to be fulfilled. Furthermore, it has helped in establishing a basis for interpreting results of the study.

IV. THE STUDY DESIGN AND METHOD OF ANALYSIS

A. INTRODUCTION

This chapter presents the design of the research project and discusses analytic methods. The study has utilized the Delphi method consisting of three sequential questionnaires. Questionnaires were distributed among respondents called in this study "the panel of experts".

The chapter is organized into sections based upon each main step of the research project.

Table IV.1 presents the main stages of the research project and indicates when they occurred.

B. THESIS COMMITTEE

The study was undertaken and supervised by the author with the assistance of a 4-person thesis committee. The establishment of the thesis committee was based on the criterion, that the committee as a whole should possess expertise on all aspects of the project.

The thesis committee consisted of four employees of the University of Alberta: Dr. Murray Hawkins and Daryll Murri, professors at the Department of Rural Economy, Dr. Wayne Lamble, professor at the Faculty of Extension, and Jim Copeland, Faculty Service Officer at the Department of Rural Economy. This committee played an important role in providing guidance and suggestions in selection of respondents, design of the study and method of analysis.

Table IV.1. Timetable of Main Research Stages, Alberta, 1986

MAIN RESEARCH STAGES	WHEN
1. Literature Review	May -July 1985
2. Nominating Process	August - September 1985
3. Round I Questionnaire	
a. Design	August - September 1985
b. Pretest	October 1985
c. Mailing	November 19, 1985
d. Deadline	December 13, 1985
e. Analysis	December 1985 - January 1986
4. Round II Questionnaire	
a. Design and Pretest	February 1986
b. Mailing	March 3, 1986
c. Deadline	March 21, 1986
d. Analysis	April - May 1986
5. Round III Questionnaire	
a. Design and Pretest	May - June 1986
b. Mailing	June 20, 1986
c. Deadline	July 15, 1986
d. Analysis	July - August 1986

Additionally, the advice of the Alberta Cattle Commission, regarding timing of the nominating process and the study itself, was used. As well, The Commission helped with motivating participants by supplying the author with a cover letter supporting the objectives of the study.

C. SELECTION OF RESPONDENTS

The purpose of the study and character of the study design required identification and participation of a group of respondents who (1) feel personally involved in the problem; (2) have pertinent information to share; (3) are recognized as knowledgeable about the beef industry; (4) are motivated to include the questionnaires in their schedule of competing tasks; (5) feel that the participation of other representatives will generate information which they value and to which they would not otherwise have access; and (6) would represent different groups of interest such as producers, processors, retailers, government and consumers.

In order to fulfill these requirements two steps were undertaken. Firstly, the president of the Consumers' Association of Alberta, Ms. Ruth Wood, was invited to generate a list of possible consumers' representatives. As a result, a list of six prospects was established.

Secondly, a two round peer nominating process was applied to select representatives of government and the main sectors of the beef industry such as, producers, packers/processors, and retailers. The first round of the process generated 25 names representing all sectors of the beef industry. A member of the thesis committee, Dr. Murray Hawkins was responsible for establishing this list of names using criteria outlined above. In the second round, these 25 people were contacted by telephone and invited to nominate others who they thought were the most knowledgeable representatives of each interest group in the beef industry.

Those who agreed to participate in the nominating process received a package containing a cover letter describing the purpose of the study and the qualifications of desirable respondents, a copy of the letter stating support of the University of Alberta for the study, and a postpaid self-addressed envelope. Eighteen people out of 24 invited to participate in the nominating process responded by sending list of people they recognized as the most knowledgeable in the beef industry. The final round of the nominating process generated over 200 names representing all interest groups, except consumers, in the beef industry. People who received the most nominations in each interest group through this referral process and consumers' representatives were contacted by telephone and invited to participate in the study. Each person was presented with the objectives of the study, the nature of the respondent panel, the length of time required to complete questionnaires, and the obligations of respondents. All 52 people contacted agreed to participate in the study and became members of the panel of experts.

The process of selecting the study's participants began in August 1985 and was completed two months later with the establishment of the panel of experts.

Table IV.2 presents the breakdown of returns by category of respondents.

D. FIRST ROUND QUESTIONNAIRE

The first round questionnaire[34] was designed in order to obtain a preliminary forecast and underlying assumptions on a number of items and to establish a preliminary list of possible technological changes and government

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[34] A copy of the first round questionnaire is found in Appendix B.

Table IV.2. Participation and Returns by Category of Respondents (Subpanel), Alberta, 1986

SUBPANEL	AGREED TO PARTICIPATE	FORMALLY WITHDREW	DELPHI PANEL	COMPLETED ROUND I	COMPLETED ROUND II	COMPLETED ROUND III
Producers	13	0	13	8	4	4
Processors	13	2	11	7	3	6
Retailers	7	2	5	3	3	3
Consumers	6	0	6	6	6	5
Government Employees	13	0	13	12	12	12
TOTAL	52	4	48	36	28	30

programs/policies requirements at each sector of Alberta's beef industry.

This questionnaire was developed and tested with the thesis committee and six representatives of the beef industry who were not selected to the final panel of experts. This process took place during the months of August and September, 1985. The final version of this questionnaire consisted of two main sections. Part A of the first section, "Beef Industry 2000", contained the following eight graphs:

1. Per capita consumption of beef in Canada.
2. Consumption of beef as a percentage of total meat consumption (red meat and poultry excluding fish).
3. Farm cash income from cattle and calves as a percentage of total farm incomes in Alberta.
4. Alberta's beef cow herd as a percentage of the Canadian beef cow herd.
5. Slaughter cattle marketed in Alberta as a percentage of slaughter cattle marketed in Canada.
6. Inspected domestic slaughter of cattle in Alberta as a percentage of inspected domestic slaughter of cattle in Canada.
7. Feedlot finished cattle in the Southern region[35] as a percentage of total feedlot finished cattle in Alberta.
8. Inspected cattle slaughter in the Southern region as a percentage of Alberta inspected slaughter.

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[35] Southern region consists of Census Divisions 1 to 6.

A trend line, usually running from 1970 to 1984, was shown on each graph. Respondents were presented with a table adjacent to a graph containing plotted data. Respondents were asked to enter values they believed would prevail in 1990, 1995 and year 2000. The panel was invited to use graphs for plotting their estimates in order to help them to visualize possible values for selected periods.

Three questions were associated with each graph:

1. How reliable do *you* consider *your* prediction to be?.
2. What key developments (assumptions) did *you* assume in making *your* prediction?.
3. What other developments (your uncertainties) not considered above might result in major revisions in *your* prediction?.

In the first question respondents were presented with a reliability scale (0 to 100) in order to ease their answer. Part A of Section I was preceded by an example of the expected response format.

Part B of Section I consisted of a single open-ended question asking respondents to list technological changes they anticipated within the next 10-15 years at each level of the beef industry. Respondents were supplied with a blank sheet for each sector of the beef industry.

The second section, "Policy", consisted of an open-ended question asking respondents to state issues and corrective actions that they believed should be considered in future programs/policies at each sector of the beef industry by policymakers. The organization of this question was identical to that in Part A of Section I.

Fifty-two questionnaires supplemented by a cover letter, a letter of support for the study from the Alberta Cattle Commission, and a self-addressed postpaid envelope were mailed out on October 1, 1985. The cover letter thanked the respondent for participating, explained the purpose of the study and provided instructions and a response deadline.

Thirty-six questionnaires were returned. Three members of the panel requested to be withdrawn due to the conflict between the scarcity of their spare time and the demanding nature of the study.

All questionnaires passed the edit and were analyzed by the author during January 1986. Responses to the first round generated almost 1200 single ideas. All statements were rewritten in original form and distributed, according to their contents, to the following categories:

1. Technological Changes
2. International Considerations
3. General Assumptions/Statements
4. Specific Assumptions/Statements:
    a. concerned with beef consumption;
    b. concerned with importance of the Alberta beef industry; and
    c. concerned with geographical distribution of feedlots and processors in Alberta.
5. Policy Requirements

Further distribution into three subgroups:

a) at the producer level;
b) at the processor level; and
c) at the retailer level.

took place for two categories, Technological Changes and Policy Requirements.

The next step involved the consolidation of statements bearing a similar message into one general assumption/statement. An attempt was made to preserve the content of the original statements and to avoid ambivalent wording. The process resulted in the final 194 headings grouped to one of the five categories described above[36].

E. SECOND ROUND QUESTIONNAIRE

The second round questionnaire[37] was entirely based upon responses received in the previous round. It consisted of two main sections. Part A of Section I contained 76 assumptions/statements grouped under one of the following headings:

1. Technological Changes:
    a. at the producer level;
    b. at the processor level; and
    c. at the retailer level.
2. International Considerations
3. General Assumptions/Statements

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[36] The detailed list of these items and their codes are found in Appendix E.

[37] A copy of the second questionnaire is found in Appendix C.

Respondents were asked to evaluate those statements for their importance and validity[38] on a five-point scale supplied in the Scales Booklet (refer to Table IV.3).

Part B consisted of graphs from the first round and accompanying specific assumptions grouped into 3 subject categories:

1. Assumptions and graphs concerned with beef consumption.
2. Assumptions and graphs concerned with importance of the Alberta beef industry.
3. Assumptions and graphs concerned with the geographical distribution of feeding and processing enterprises in Alberta.

Respondents were asked to evaluate first all specific assumptions preceding the group of graphs for their importance and validity and then to follow instructions connected with the graphs. Trend lines were extended to the year 2000 using average values obtained from responses of the first round. Furthermore, each graph was accompanied by a table containing the panel's low, high and average estimates. Respondents were asked to state their current estimates based upon the review of underlying assumptions and estimates generated by the group as a whole. Respondents whose estimates differed from the average value were asked to explain reasons for doing so.

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[38] The description of validity scale is based on the scale applied by Nancy H. Goldstein and Murray Turoff. Goldstein and Turoff, 1971.

TABLE IV.3. The Description of Importance and Validity Scales, Alberta, 1986

IMPORTANCE SCALE

1. Very Unimportant
    - worthless as a decision basis
2. Unimportant
    - not willing to make decision based upon this alone
3. Indeterminable
    - assumption whose effect on an item of interest is undeterminable
4. Important
    - willingness to make a decision upon this
5. Very Important
    - decision based upon this will not be wrong

VALIDITY SCALE

1. Very Invalid/Unreliable
    - great risk of being wrong
    - the converse, if it exists, is possibly certain
2. Invalid/Unreliable
    - substantial risk of being wrong
    - many incorrect interferences can be drawn
    - the converse, if it exists, is possibly Valid
3. Indeterminable
    - the information or knowledge to evaluate the validity of this assertion is not available to anyone
4. Valid/Reliable
    - some risk of being wrong
    - assuming this to be true but recognizing some chances of error
    - some incorrect interferences can be drawn
5. Very Valid/Reliable
    - low risk of being wrong

The second section consisted of 52 statements indicating policy needs aimed at each of the three main sectors of the beef industry: producing, processing and retailing. Respondents were asked to evaluate each recommendation for its desirability and feasibility[39] on a five-point scale supplied in the Scale Booklet (refer to Tables IV.4 and IV.5)

The second round questionnaire, the cover letter, the Scale Booklet and a self-addressed postpaid envelope were sent to each of the remaining 49 participants on February 8, 1986. The cover letter thanked the participants for their responses, indicated the purpose of the second questionnaire and its place in relation to the previous questionnaire. The Scale Booklet contained the description of each point for four different 5-point scales, i.e. Importance, Validity, Desirability and Feasibility.

Twenty-eight questionnaires were returned resulting in a response rate of 57 percent, 16 percentage points lower than that in the first round. One member of the panel requested to be withdrawn from the study, for the same reason as the previous three members did.

The analysis of the responses to the second questionnaire consisted of the calculation of descriptive statistics for each item. Means and standard deviations were calculated for each of eight variables. Medians and

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[39] The description of desirability and feasibility scales is based on scales applied by Irene Anne Jillson. Linstone and Turoff, 1975, p. 124.

TABLE IV.4. The Description of Desirability Scale, Alberta, 1986

DESIRABILITY SCALE

1. Very Undesirable
- will have major negative effect
- social costs far outweigh any social benefits
- not justifiable
- extremely harmful in and of itself

2. Undesirable
- will have a negative effect with little or no positive effect
- social costs greater than social benefits
- may only be justified in conjunction with a highly desirable item
- harmful in and of itself

3. Indeterminable
- will have equal positive and negative effects
- social benefits equal social costs
- may be justified in conjunction with other desirable or highly desirable items
- no value in and of itself

4. Desirable
- will have a positive effect with minimum negative effect
- social benefits greater than social costs
- justifiable in conjunction with other items
- little value in and of itself

5. Very Desirable
- will have a positive effect and little or no negative effect
- social benefits will far outweigh social costs
- justifiable on its own merit
- valued in and of itself

TABLE IV.5. The Description of Feasibility Scale, Alberta, 1986

FEASIBILITY SCALE

1. **Very Infeasible**
    - cannot be implemented (unworkable)
    - basic research needed (no relevant technology exists)
    - unprecedented allocation of resources would be needed
    - politically unacceptable
    - completely unacceptable to the general public

2. **Infeasible**
    - some indication this cannot be implemented
    - major research and development effort needed
    - large scale increase in available resources would be needed
    - major political roadblocks
    - not acceptable to a large proportion of the general public

3. **Indeterminable**
    - contradictory evidence this can be implemented
    - indeterminable research and development effort needed
    - increase in available resources would be supplemented
    - political roadblocks
    - some indications this may not be acceptable to the general public

4. **Feasible**
    - some indication this can be implemented
    - some research and development work required
    - available resources would have to be supplemented
    - some political roadblocks
    - some indication this may be acceptable to the general public

5. **Very Feasible**
    - can be implemented
    - no research and development work required
    - definitely within available resources
    - no major political roadblocks
    - will be acceptable to the general public

interquartile ranges (Q) were calculated for each of the items classified as technological changes, international considerations, general and specific assumptions and government policy requirements. The median score provided the basis for determining the ranking of items. The interquartile range indicated the degree of consensus among respondents.

The program "Lotus 123 version 2.0" was used to calculate means, standard deviations, frequencies and cumulative proportions. In order to calculate medians and interquartile ranges the following formulas were used:

1. Median

$C_{50} = l_2 + [(0.50 + p_2) / r_2] * i$

2. Interquartile range - Q

$Q = C_{75} - C_{25}$

$C_{25} = l_1 + [(0.25 + p_1) / r_1] * i$

$C_{75} = l_3 + [(0.75 + p_3) / r_3] * i$

where,

$l_{1,2,3}$ - the lower limit of interval in which 25th, 50th, and 75th centile falls, respectively

$p_{1,2,3}$ - the sum of proportions below the interval in which the 25th, 50th, and 75th centile falls, respectively

$r_{1,2,3}$ - the proportions within the interval in which the 25th, 50th, and 75th centile falls, respectively i - the width of the interval, which is assumed to be equal to 1

In order to calculate median and interquartile range, frequencies of responses to each statement at each of two appropriate scales were obtained. This allowed calculation of frequencies as a proportion for each scale applied in the evaluation of a given statement. Finally, cumulative proportions representing the proportion of judgements in a given category plus the sum of all proportions in categories below that category were obtained. The final values of medians and interquartile ranges were calculated by the author.

The width of the interval for each of five categories was assumed to be 1.0, except for two extreme categories which intervals were assumed to be 0.5. As a result the number assigned to a given category ranges from 0.5 of unit below to 0.5 of unit above the assigned number. The Table IV.6 presents intervals for each category of four scales applied in the study.

The median of the distribution of judgements for each statement was taken as the scale value of the statement. Interquartile range was employed as a measure of the variation of the distribution of judgements for a given statement. The interquartile range is a measure of the spread of the middle 50 percent of the judgements. When

TABLE IV.6. Points and Their Intervals for Scales Applied in the Study, Alberta, 1986

POINT	RANGE	DESCRIPTION OF CATEGORY
1	1.00 to 1.50	very unimportant; or very invalid; or very undesirable; or very infeasible
2	1.51 to 2.50	unimportant; or invalid; or undesirable; or infeasible
3	2.51 to 3.50	indeterminable
4	3.51 to 4.50	important; or valid; or desirable; or feasible
5	4.51 to 5.00	very important; or very valid; or very desirable; or very feasible

there is a good agreement among subjects in judging a statement, the Q value will be small compared with the value obtained when there is relatively little agreement among subjects. The value of 1.25 for interquartile range was chosen as the dividing point between statements obtaining consensus and statements creating group disagreement[40].

F. THIRD ROUND QUESTIONNAIRE

The third and final round of questionnaires was used in order to permit participants to review prior responses and to express their final individual judgements for selected items by using appropriate scales. The final questionnaire[41] was organized in a similar way as the second questionnaire. However, the graphs and tables from the previous two rounds were not presented for further evaluation. Only statements exhibiting high variability of measurement (Q>=1.25) at any scale applied to evaluate these statements were selected for reevaluation in the third questionnaire. Furthermore, statements being rated unimportant or undesirable, with interquartile range values lower than 1.25 in the second round, were not presented for further evaluation in the subsequent round.

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[40] Appendix F contains detailed results of the second round evaluation process.

[41] A copy of the third round questionnaire is found in

Each statement used in the third round questionnaire was accompanied by preliminary ratings in the form of the panel's low, high and average values generated on each scale in the second round. Respondents were asked to review each item and its preliminary ratings, comment on any item they wished to clarify for its meaning or ranking and to provide a final rating for each item by using appropriate scales.

The scales applied in the final round were the same as in the previous round.

All statements constituting Section I of the questionnaire were evaluated for their importance and validity. Section I consisted of two parts: Part A and Part B. Fifty-three statements belonging to Part A were grouped under one of the following headings: Technological Changes, International Considerations, Other General Assumptions. Part B consisted of 23 specific assumptions grouped in one of three categories:

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[41](cont'd) Appendix D.

1. Assumptions concerned with beef consumption.
2. Assumptions concerned with Alberta's share in the national numbers of beef cows, slaughter cattle and beef carcasses.
3. Assumptions concerned with expansion of the feeding and processing industry in Southern Alberta.

Section III consisted of 27 statements indicating policy needs aimed at each of the three main sectors of the beef industry.

Round three questionnaires were sent to 48 respondents on May 31, 1986. Only 16 respondents replied before or at the date set as a deadline. In order to generate additional responses remaining respondents were contacted by telephone and asked to reply to the final questionnaire. Some respondents indicated that the questionnaires were already mailed.

Thirty panel members actually replied to Round III. A computer program provided the means, standard deviations , percentage and cumulative distributions. Final medians and interquartile ranges were calculated using formulas discussed in the previous section[42].

All questionnaires were designed in a form encouraging respondents to comment on any item, to add new or clarify meaning of existing items. The cover letters to the second and the third round questionnaires emphasized the fact that respondents could join the study even if they did not participate in previous rounds.

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[42] The detailed results of the third round evaluation process are found in Appendix G.

Participation in the study was voluntary and no honorarium was paid to respondents. However, participants were promised a summary of the final results.

V. PREDICTIONS AND THEIR UNDERLYING ASSUMPTIONS

A. INTRODUCTION

Part A of Section I of the first questionnaire was utilized to obtain a preliminary forecast on eight variables and a list of assumptions underlying those predictions. That part of the questionnaire was organized in the form of eight graphs containing historical data on the following variables for which changes were to be predicted:

1. Per capita consumption of beef in Canada.
2. Consumption of beef as a percentage of total meat consumption (red meat and poultry excluding fish).
3. Farm cash income from cattle and calves as a percentage of total farm cash incomes in Alberta.
4. Alberta's beef cow herd as a percentage of the Canadian beef cow herd
5. Slaughter cattle marketed in Alberta as a percentage of slaughter cattle marketed in Canada.
6. Inspected domestic slaughter of cattle in Alberta as a percentage of inspected domestic slaughter of cattle in Canada.
7. Feedlot finished cattle in the Southern region as a percentage of total feedlot finished cattle in Alberta.
8. Inspected cattle slaughter in the Southern region as a percentage of Alberta inspected slaughter.

Each graph contained a trend line covering usually the period from 1970 to 1984 and was accompanied by a table containing values presented in a given graph and three questions[43]. The task of respondents was to enter values they believed would prevail in given points in time, usually years: 1990, 1995, and 2000. Furthermore, they were asked to answer three questions following each graph. The first question was used to determine the confidence which respondents attached to their estimates. Respondents were supplied with a reliability scale from 0 to 100 and were asked to indicate the level of confidence related to their estimates. However, it was found by the author that the question was improperly formulated. The main problem was connected with the fact that whereas respondents were confident about their predictions of changes for earlier periods, their confidence level was much lower for estimates related to more distant future. That resulted in difficulty of stating the fixed reliability level of estimates for all periods at the same time. As a result, it was the decision of the author to drop this question from the study and not to present the results of responses to that question.

The last two questions were applied to stimulate respondents to generate the list of assumptions on which their predictions would be based.

The responses to the first round questionnaire resulted in preliminary predictions of future changes for eight variables of interest and in 944 single assumptions underlying those predictions. The editing process resulted in 96 common headings which were divided into three main categories:

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[43] These questions are outlined in Chapter IV.

1. International considerations.
2. General assumptions.
3. Specific assumptions.

Further subject classification of general assumptions resulted in five subgroups:

- a. Economic outlook,
- b. Production,
- c. Government involvement,
- d. Marketing and promotion, and
- e. Consumers' preferences.

As well, additional classification based upon the type of variables was conducted for specific assumptions and led to the following subcategories:

- a. specific assumptions concerned with beef consumption,
- b. specific assumptions concerned with importance of the Alberta beef industry, and
- c. specific assumptions concerned with geographical distribution of feedlots and processors in Alberta.

Those three main categories of assumptions were presented in the second round questionnaire for the evaluation process. Respondents were asked to evaluate them for their importance and likelihood of occurrence. Each subcategory of specific assumptions accompanied the appropriate group of graphs. Each graph contained a trend line based upon historical data and predicted values. Respondents were asked to reevaluate their estimates after reviewing the list of assumptions and technological changes, and the panel's estimates. The responses to the second questionnaire resulted in 37 items obtaining consensus on both scales or being rated either unimportant or invalid. Two items were discarded due to a calculation error which occurred in the analysis phase. The third round questionnaire contained 56 assumptions belonging to one of three main categories. The respondent's task was to state new ratings after reviewing results of the second round evaluation process in the form of mean, low and high values. Graphs were not presented in the third round questionnaire.

This chapter was organized into four main subsections based upon classification of assumptions and supplemented by presentations of the panel's predictions. In the first three sections the evaluation process and final ratings of assumptions underlying predictions are presented. Finally, the fourth section contains predictions of changes for the selected eight variables.

B. INTERNATIONAL CONSIDERATIONS

The first round responses resulted in 45 single international considerations which were further edited into 13 common headings, with one assumption being accompanied by two factors of change. Those final 13 international considerations were presented in the second round for the evaluation process on both scales, Importance and Validity. Additionally, respondents were asked to indicate if they agree or disagree with factors of change accompanying main headings. Only 3 items obtained consensus on both scales as a result of the second round evaluation process. The assumption of a further increase in the quantity of beef sold in Pacific North-West USA was rated as very important[44] and valid. Another two international considerations: (1) the world surplus of vegetable oils will continue; and (2) increased prices of vegetable protein as a result of lack of water in major growing areas of USA; were rated as indeterminable on both scales. The remaining 10 headings were presented for the final round of the evaluation process. This process resulted in additional six items obtaining consensus on both scales. Three of them were rated as important and valid, and the remaining three: (1) restrictions in the trade of cattle between Canada and USA; (2) the world surplus of wheat will continue; and (3) no large importations of cheap meat beyond todays level; were rated as important international considerations with indeterminable validity. Among headings which obtained consensus on only one of two scales the following items and their ratings are worthy of attention:

1. The loss of access to the U.S. market, particularly Pacific North-West was rated as very important. However, consensus on likelihood of occurrence of this assumption

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[44] Ratings: "very important" and "very desirable" as determined in Chapter IV.

could not be obtained.

2. Restrictions in the trade of cattle between provinces was evaluated as an important assumption but again the panel could not agree on its validity.

The analysis of responses to factors of change listed under common headings (only one) which were rated by the panel as important and valid resulted in the following observation. The majority of respondents agree that the main factor of a further increase in the quantity—of beef from Western Canada sold in the Pacific North-West of the United States is the transportation cost relation between West-East and North-South.

Table V.1 contains a list of important and valid international considerations ordered according to descending importance score. The first two columns contain the code and the description of each item. Columns 3 and 4 present final rating of each item on both scales. Finally, the fifth column gives information about the number of rounds of the evaluation process required to obtain consensus on both scales. All tables of the same nature, presented in Chapters V, VI, and VII, are organized identically. Examining Table V.1, it can be noticed that the panel believes in a further expansion of Western Canada cattle and beef exports despite possible restrictions in the trade of beef between the United States and Canada.

Table V.1. The List of Important and Valid International Considerations, Alberta, 1986

CODE (1)	INTERNATIONAL CONSIDERATIONS (2)	IMPOR- -TANCE SCORE (3)	VALI- -DITY SCORE (4)	NO OF ROUNDS (5)
A30	Further increase in the quantity of beef from Western Canada sold in Pacific North-West of the United States	4.59	3.93	1
A28	Development of new and/or expansion of already established export markets in USA	4.50	3.83	2
A33	Restrictions in the trade of beef between Canada and USA	4.48	3.61	2
A29	Development of new and/or expansion of already established export markets in Pacific Rim Countries	4.14	3.68	2

C. GENERAL ASSUMPTIONS

The first round questionnaire led to 400 single assumptions. The editing process led to 38 common headings which were divided into the following 5 subgroups:

a. Economic outlook - 8 assumptions.

b. Production - 15 assumptions.

c. Government involvement - 5 assumptions.

d. Marketing and promotion - 6 assumptions.

e. Consumers' preferences - 4 assumptions.

Those 38 assumptions were presented for the second round evaluation process. Respondents were asked to evaluate each assumption on importance and validity scales. In the case of one assumption, increased competitiveness of beef will occur, they were asked to indicate if they agree or disagree with each of four factors of change listed under this heading.

Fourteen headings obtained consensus on both scales as a result of the second round evaluation process. Ten of them were evaluated as important and valid assumptions. The assumption that the herd rebuilding phase of the cattle cycle will take place by the end of the 90's was rated as an important production assumption with indeterminable validity. Additional 3 assumptions: (1) increased prices of agricultural machinery will favor beef production; (2) recreational pressure on some good land will be more than offset by a shift of marginal land from cash crops production to beef production; and (3) beef will lose its attraction as a loss leader in retailing; were rated as indeterminable on both scales. Finally, one item was dropped from the study due to an error which occurred in calculations and the remaining 23 assumptions were presented for the final round of the evaluation process.

The third round evaluation process led to the following observations:

1. Four assumptions joined the pool of important and valid assumptions
2. Such assumptions as: (1) an upswing in the Canadian economy will take place in the 90's; (2) higher interest rates will prevail by the year 2000; (3) difficulties with obtaining new credits will continue; (4) Alberta's human population will remain unchanged; (5) cattle cycle no longer exists due to world supply of beef; and (6) the number of calves produced will not decline further because it is determined by availability of marginal land and residuals feeds; were rated as important assumptions with indeterminable validity.
3. Two assumptions, (1) new lands being opened are better suited for forage production and (2) rationalization of government support programs across provinces leading to uniform approach, were recognized by the panel as important assumptions. However, the agreement on their validity could not be reached.
4. The panel agrees that such assumptions as: (1) the place left by less efficient producers will be taken up by new

entrants; and (2) the place left by less efficient producers will not be taken up by more efficient producers since cow/calf operation is land based; were indeterminable on both scales.

The analysis of responses to factors of change listed under valid and important assumptions led to the following conclusions.

The majority (65% or more) of respondents agree that:

1. (a) Increased consumer consciousness regarding drug and chemical residues in consumer meat (especially poultry and pork); and (b) more improvement potential for beef than for other meats, which have already made use of most new technology available to them; are the main factors of increased competitiveness of beef in future.
2. The factors of change such as: (a) animal rights people will succeed in limiting or banning the intensive production of meat, especially poultry and hogs; and (b) acceptance of yellow fat by consumers; will not take place and will not affect the competitiveness of beef.

Table V.2 contains a list of important and valid general assumptions ordered according to descending importance score. Its content indicates that the beef industry is a mature industry and the trend in the growth of the Canadian human population will result in an aged population. Furthermore, the increased competitiveness of beef and higher efficiency of the producing sector could be expected. The panel agrees that the expansion of the cattle

Table V.2. The List of Important and Valid General Assumptions, Alberta, 1986

CODE (1)	GENERAL ASSUMPTIONS (2)	IMPOR- -TANCE SCORE (3)	VALI- -DITY SCORE (4)	NO OF ROUNDS (5)
Economic Outlook:				
A46	The beef industry is a mature industry	4.11	4.06	1
A44	Canadian population is aging	3.97	4.22	1
Production:				
A50	Increased competitiveness of beef will occur	4.33	3.83	2
A56	Rising inputs, processing and retailing costs will squeeze out producers with lower efficiency	4.07	4.06	1
A48	The optimism of rebuilding phase of cycle will be dampened by limitations in price imposed by competitive meats whose price cycle are not in phase with beef	4.03	3.79	1
A49	The optimism of rebuilding phase of cycles will be enhanced by prospect of lower grain prices	3.95	3.61	1

Continued...

Table V.2. (Continued)

(1)	(2)	(3)	(4)	(5)
Government Involvement:				
A62	Rationalization of crow benefit issue (benefits paid to producers) or continuation of Alberta feed grain policy	4.54	3.72	2
A63	Continued role of government interfering with true market signals and causing distortions to production decisions	4.12	3.92	1
Marketing and Promotion:				
A67	More aggressive and more innovative advertising and promotion of beef products will take place	4.29	3.93	2
A68	Research and industry effort will alleviate many health concerns	4.17	3.88	1
A72	A supply management marketing board will be continued for poultry	3.89	3.99	2
Consumers' Preferences:				
A73	Trend to smaller servings, lower calorie intake	4.33	4.11	1
A74	Consumer preferences will continue changing toward light and convenient foods	4.09	4.00	1
A75	Consumption of meat has plateaued at a level of around 200 lbs per capita and will remain similar until the year 2000	4.07	3.83	1

herd will be affected by: (1) price competition from other meats; and (2) lower grain prices. The rationalization of the federal Crow benefit is expected. However, the panel anticipates that a role of government interfering with market signals will continue. Additionally, the panel agrees that changes in consumer preferences and more aggressive promotion techniques for beef products should be expected. Finally, it is anticipated that the research and industry effort will alleviate health concerns associated with beef products.

D. SPECIFIC ASSUMPTIONS

The assumptions directly related to any of eight variables established the group of specific assumptions. Further classification based upon type of change represented by variables was conducted.

(1) Concerned with Beef Consumption

The assumptions concerned with beef consumption accompanied the first two variables:

1. Per capita consumption of beef in Canada.
2. Consumption of beef as a percentage of total meat consumption.

Eleven assumptions were presented for evaluation in the second round questionnaire. Five of them obtained consensus on both scales. The assumption, a lack of cooperation in order to change selling techniques at retail store level, was rated as an important assumption with indeterminable validity. Four other assumptions were evaluated as important and valid. Finally, the assumption that increased demand for white veal will occur was rated as unimportant. The remaining 5 assumptions went through the final round of the evaluation process. As a result, only one assumption, adverse publicity toward other food items, obtained consensus on both scales (being rated as an indeterminable on both scales).

Assumptions such as: (1) consumers will realize that beef is a source of comparatively low cost "valuable nutrients"; (2) white meat and pork processing innovations will continue at a faster pace; (3) increased competition from other protein sources; and (4) per capita consumption will continue to be determined by herd production which tends to go in 10 years cycles modified by product price, price of competitive products and cost of inputs; were evaluated as important assumptions to the prediction of beef consumption. However, respondents could not obtain consensus on their validity.

Table V.3 contains a list of important and valid specific assumptions concerned with beef consumption ordered according to descending importance score. The results of the analysis presented in Table V.3 suggest that such factors as, (1) the continued popularity of beef hamburgers; and (2) preferred taste of beef; are main factors favouring beef consumption. On the other hand, decreasing disposable

Table V.3. The List of Important and Valid Specific Assumptions Concerned with Beef Consumption, Alberta, 1986

CODE	SPECIFIC ASSUMPTIONS	IMPOR- -TANCE SCORE	VALI- -DITY SCORE	NO OF ROUNDS
B 2	Beef will continue to be a preferred meat due to its flavor	4.27	3.91	1
B 4	Beef hamburgers will continue to be the main form of meat consumption	4.03	3.78	1
B 9	The consumption of beef is more affected by changes in disposable income than other meats	3.97	3.87	1
B 7	Increasing popularity of poultry in fast food outlets	3.94	3.78	1

incomes and increasing popularity of poultry in fast food outlets could negatively affect beef consumption.

(2) Concerned with Importance of Alberta's Beef Industry

Fourteen assumptions belonging to this subcategory accompanied the following four variables:

1. Farm cash income from cattle and calves as a percentage of total farm incomes in Alberta.
2. Alberta's beef cow herd as a percentage of the Canadian beef cow herd.
3. Slaughter cattle marketed in Alberta as a percentage of slaughter cattle marketed in Canada.
4. Inspected domestic slaughter of cattle in Alberta as a percentage of inspected slaughter of cattle in Canada.

The second round evaluation process resulted in 5 assumptions obtaining consensus on both scales. Four of them were rated as important and valid. The fifth assumption, dairy-beef cow numbers will decline more in the East as dairy products build up, was rated as important with indeterminable validity. Furthermore, the assumption that the U.S. processors will establish new plants close to the border to draw finished animals to the United States, was viewed by the panel as invalid. The remaining eight assumptions were presented in the final evaluation round which led to the following observations:

a. Additional two items joined the pool of important and valid assumptions.

b. The panel agrees that such assumptions as; (1) the increased demand for Alberta's feeders from other provinces and USA; (2) one plant in North-Central region of Alberta will close without offsetting increase in capacity by existing plants or by new plants; (3) Saskatchewan has the ability to increase significantly its role in the national beef industry thereby decreasing Alberta's share; however this is not likely to occur; (4) Alberta has appropriate facilities and therefore everything that is produced will be fed and slaughtered in Alberta in order to avoid unnecessary costs; and (5) no change in the meat aging process and continuation of using transit time and transport resources as aging facilities; are all important with indeterminable validity.

c. The assumption that increased numbers of slaughter cattle would be shipped across the U.S. border due to the failure of Alberta plants to meet low cost of operation of the U.S. plants was rated as important. However, the panel disagrees on its validity score.

Table V.4 contains a list of important and valid specific assumptions concerned with the importance of the Alberta beef industry, ordered according to descending importance score. Examining Table V.4, it can be observed that:

1. The further increase in importance of the Alberta beef industry will be fostered by such factors as, a

Table V.4. The List of Important and Valid Specific Assumptions Concerned with Importance of the Alberta Beef Industry, Alberta, 1986

CODE	SPECIFIC ASSUMPTIONS	IMPOR- -TANCE SCORE	VALI- -DITY SCORE	NO OF ROUNDS
C 1	Alberta will continue to have natural comparative advantage (land, climate, capital, and expertise)	4.50	4.24	1
C 7	Overcapacity and low margins do not favor new plants in Alberta	4.15	3.98	1
C 9	The Montreal market remains the major market for Alberta beef	4.06	3.72	2
C 3	The gap between transportation rates of live cattle and dressed beef will widen	3.97	3.81	2
C12	During herd rebuilding stage the cow herd numbers will shift to Saskatchewan and Alberta and build around around mixed grain/beef cow economy	3.96	3.57	1
C11	Ontario, Quebec, Manitoba have more production options for their available land base and can obtain better payback from subsidization of operations other than beef	3.83	3.67	1

continued comparative advantage, a shift to mixed grain/beef cattle economy, existing processing overcapacity, and an increasing spread in transportation costs for live cattle and ready products.

2. The Montreal market remains the major market for Alberta's beef.

(3) Concerned with Geographical Distribution of the Beef Industry

Twenty assumptions belonging to this subcategory accompanied the following two graphs in the second round questionnaire:

3. Feedlot finished cattle in the Southern region (Census Divisions 1-6) as a percentage of total feedlot finished cattle in Alberta.
4. Inspected cattle slaughter in the Southern region as a percentage of Alberta inspected slaughter.

The evaluation process of the second round questionnaire resulted in seven assumptions obtaining consensus on both scales. Six of them were rated as important and valid assumptions. Whereas, the seventh assumption, higher price differential on grain between both regions, was rated as important with indeterminable validity. Additionally, one item was dropped from the study due to an error which occurred in calculations.

The evaluation process of the third round questionnaire applied to the remaining 12 assumptions led to the following results:

1. No additional assumption joined the pool of important and valid assumptions.
2. The panel agrees that importance and validity of such assumptions as: (1) the overcapacity of facilities in Southern Alberta ; (2) higher protein feeds in Southern Alberta; (3) a reduction of cattle number in Peace River area; and (4) an adequate supply of finished cattle will establish basis for slaughter facility in North-Central region; are indeterminable.
3. The assumption that higher cost of irrigation in South will force irrigated land into higher returning cash crops rather than feed was rated as important with indeterminable validity.
4. The panel agrees that the assumption of government attempting to spread out the industry through programs and regulation is invalid.

Table V.5 contains a list of important and valid specific assumptions concerned with the distribution of the Alberta beef industry, ordered according to descending importance score. Its content shows that a further expansion of the beef industry in the Southern region could be determined by such factors as, (1) closeness to alternate markets; and (2) more moderate winter climate. On the other hand, such factors as; (1) the availability of feeder cattle; (2) increasing transportation costs; and (3) suitability of the region for forage production; could be

Table V.5. The List of Important and Valid Specific Assumptions Concerned with Geographical Distribution of the Alberta Beef Industry, Alberta, 1986

CODE	SPECIFIC ASSUMPTIONS	IMPORTANCE SCORE	VALIDITY SCORE	NO OF ROUNDS
Assumptions Favoring Further Concentration of the Feedlot Industry In Southern Alberta:				
D 3	Closeness to alternate markets in Southern Alberta	3.87	3.81	1
D 5	More moderate winter climate in Southern Alberta	3.80	3.88	1
Assumptions Favoring Further Concentration of the Processing Industry In Southern Alberta:				
D11	Closeness to alternate markets	3.75	3.72	1
Assumptions Not Favoring Further Concentration of the Beef Industry In Southern Alberta:				
D14	North-Central region is better suited to grow forage what lead to backgrounding feeder cattle	3.96	3.95	1
D17	Availability of feeder cattle in North-Central region will continue and even increase	3.86	3.72	1
D16	Increasing transportation costs	3.67	3.54	1

main factors favouring the expansion of the beef industry in The North-Central region (Census Divisions 7 to 15).

E. PREDICTIONS

The prediction of future changes in (1) beef consumption, (2) importance of Alberta's beef industry, and (3) geographical distribution of the beef industry within the province were chosen for the study in order to establish the general picture of the Alberta beef industry in the year 2000.

Historical data on eight variables were presented in the form of graphs and adjacent tables in the first round questionnaire. Respondents were asked to state their predictions of changes in variables' values for given points in time. In the second round, respondents were presented with historical data updated by the panel's estimates and the list of assumptions and technological changes established in the first questionnaire. They were asked to reevaluate their previous predictions upon the review of assumptions and estimates generated by the panel.

The t test for related samples[45] was applied to determine if the feedback presented in the second round resulted in a statistically significant change of predictions from the first round. The procedure for dependent samples is based on defining new variable d_{ij}

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[45] Churchill discusses the application of the t test for related samples in his book entitled, *Marketing Research: Methodological Foundations.*

Table V.6. Results of the Statistical Analysis, Alberta, 1986

VARIABLE	NUMBER OF OBSERVATIONS	TEST STATISTIC	
d_1	3	2.84	
d_2	3	14.85	**
d_3	3	7.42	**
d_4	3	8.66	**
d_5	3	0.99	
d_6	3	0.87	
d_7	4	1.98	
d_8	4	4.66	**
d_s	23	6.85	**

where,

d_s -represents combined variable consisting of variables d_2 to d_8

** -statistically significant at 95% and 99% confidence levels

which is the difference between means from the first and second round prediction process for i-th variable and j-th period of time.

Firstly, the t test for difference in means was conducted for each variable. The first six variables had three observations each, whereas last two had four observations each. The results of this statistical analysis are presented in Table V.6. In four out of eight cases the prediction of the second round were significantly different from the first round estimates at 95% and 99% confidence levels.

Secondly, all variables whose values were presented in the form of percentages were used to establish a new variable with 23 observations (values of variable d_1 were excluded because they were expressed in pounds per capita). This was done in order to facilitate the test which would allow to make a conclusion regarding statistical significance of feedback influence on the group's predictions, in general. The t test for related samples resulted in a test statistic of 6.85 which is greater than a critical t value for 22 degrees of freedom and confidence levels of 95% and 99%. The sample evidence indicates that feedback presented to respondents in the second round affected the group's estimates.

(1) Consumption of Beef

Two variables, absolute and relative consumption of beef were employed to predict future trends in consumption of beef and its consumption in relation to other meats. The prediction of absolute quantity consumed in the year 2000 could allow for estimates of the total domestic demand for beef. Furthermore, the prediction of relative consumption of beef as a percentage of the total meat consumption could lead to valuable insights about future consumption patterns and changes in relative importance of the beef industry in comparison with other livestock industries.

The historical data were obtained from *Livestock and Animal Products Statistics* publications for the period from 1970 to 1984 for absolute values and for the period from 1971 to 1984 for relative values of beef consumption in Canada.

The results of the analysis of responses to the first and the second round questionnaires are presented in Tables V.7 and V.8. Graphs V.1 and V.2 contain trend lines based upon historical data and the panel's predictions.

The panel anticipates a further drop in absolute consumption of beef to the level of 79 pounds per capita in the period of the next few years. This trend will be reversed in the last decade of the twentieth century. However, beef consumption level greater than 80 pounds per capita is not expected. This predicted level of beef consumption for the year 2000 is 4.5 pounds lower than the consumption level of 1984 and almost 34 pounds lower than the peak beef consumption level of 1976.

A decrease in the contribution of beef in total meat consumption should also be expected. Two percentage points drop from the level of 1984 is expected by the end of 1990. Gain by one percentage point is anticipated in the last decade of the twentieth century leading to the level of 39.6 percent. Those predictions suggest per capita consumption of meat around 202 pounds in the year 2000.

Figure V.1. Per Capita Consumption of Beef in Canada (lbs/capita), Alberta, 1986

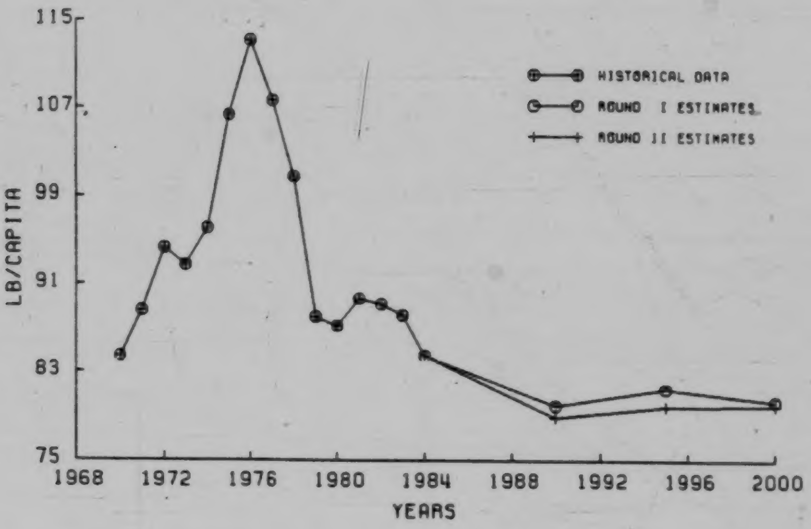

Table V.7. The Panel's Estimates of Per Capita Beef Consumption in Canada (lbs/capita), Alberta, 1986

	LOW	HIGH	AVERAGE	ST. DEV.	RESPONSES
Round I Predictions:					
1990	70.0	88.0	80.0	4.0	36
1995	70.0	96.0	81.5	6.3	36
2000	65.0	100.0	80.4	7.5	36
Round II Predictions:					
1990	70.0	87.0	79.0	3.5	28
1995	70.0	92.0	79.9	4.9	28
2000	70.0	100.0	80.0	6.2	28

Figure V.2. Consumption of Beef as a Percentage of Total Meat Consumption, Alberta, 1986

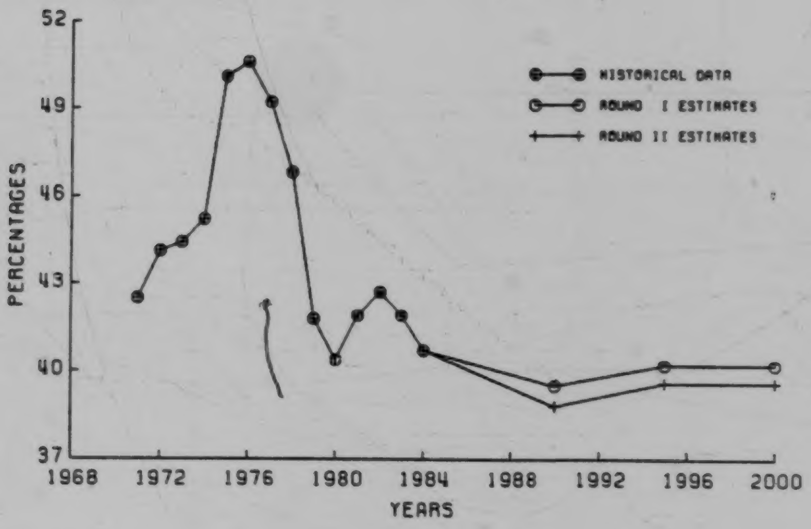

Table V.8. The Panel's Estimates of Beef Consumption as a Percentage of Total Meat Consumption, Alberta, 1986

	LOW	HIGH	AVERAGE	ST. DEV.	RESPONSES
Round I Predictions:					
1990	35.0	45.0	39.5	2.5	36
1995	32.0	50.0	40.2	4.1	36
2000	29.0	55.0	40.2	5.6	35
Round II Predictions:					
1990	34.0	40.5	38.8	1.7	28
1995	35.0	45.0	39.6	2.0	28
2000	35.0	45.0	39.6	2.3	28

(2) Importance of Alberta's Beef Industry

The following four variables were applied to predict changes in the contribution of the Alberta beef industry to farm cash incomes in the province and to the national beef industry:

1. Farm cash income from cattle and calves as a percentage of total farm incomes in Alberta.
2. Alberta's beef cow herd as a percentage of the Canadian beef cow herd.
3. Slaughter cattle marketed in Alberta as a percentage of slaughter cattle marketed in Canada.
4. Inspected domestic slaughter of cattle in Alberta as a percentage of inspected domestic slaughter of cattle in Canada.

The historical data on farm cash income were collected from *Agriculture Statistics Yearbooks*. *Livestock Market Review* publications were used to obtain data on domestic federally inspected slaughter and slaughter cattle marketed in Alberta and in Canada. Finally, beef cow numbers for Alberta and Canada were obtained from *Livestock and Animal Products Statistics*.

The results of the analysis of responses to the first and the second round questionnaires are presented in Tables V.9, V.10, V.11 and V.12. Figures V.3, V.4, V.5 and V.6 contain trend lines based upon historical data and the panel's predictions.

Figure V.3. Farm Cash Income from Cattle and Calves as a Percentage of Total Farm Incomes in Alberta, Alberta, 1986

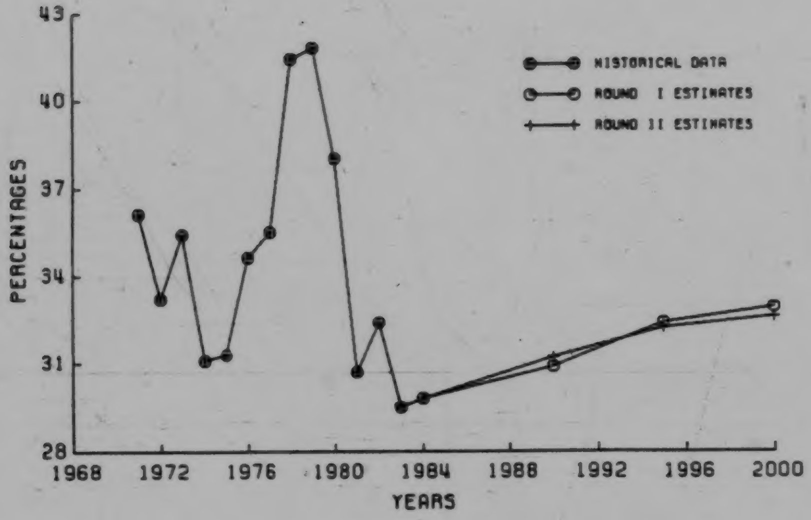

Table V.9. The Panel's Estimates of Farm Cash Income from Cattle and Calves as a Percentage of Total Farm Incomes in Alberta, Alberta, 1986

	LOW	HIGH	AVERAGE	ST. DEV.	RESPONSES
Round I Predictions:					
1990	27.0	40.0	30.9	3.0	32
1995	25.0	42.0	32.4	4.4	32
2000	25.0	50.0	32.9	6.0	32
Round II Predictions:					
1990	27.0	38.0	31.2	2.3	25
1995	29.5	40.0	32.2	2.3	25
2000	26.0	40.0	32.6	2.6	25

Figure V.4. Alberta's Beef Cow Herd as a Percentage of the Canadian Beef Cow Herd, Alberta, 1986

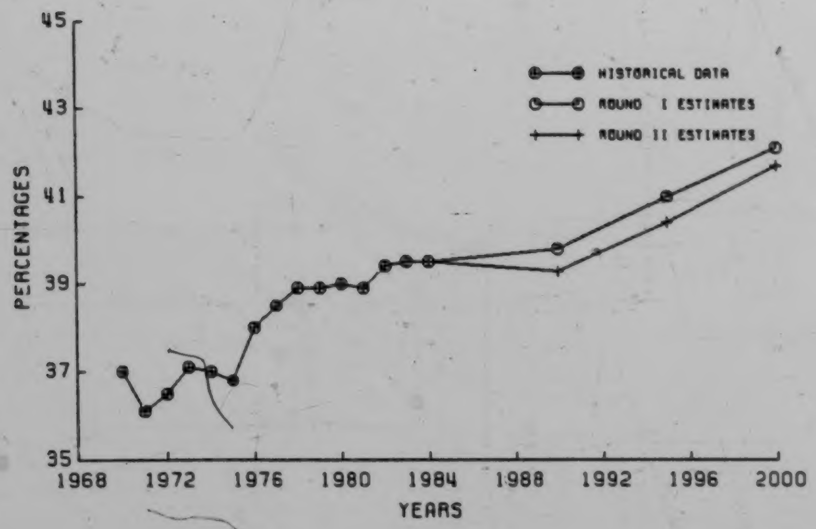

Table V.10. The Panel's Estimates of Alberta's Share in the National Beef Cow Herd, Alberta, 1986

	LOW	HIGH	AVERAGE	ST. DEV.	RESPONSES
Round I Predictions:					
1990	37.0	42.0	39.8	1.1	33
1995	37.0	45.0	41.0	2.2	33
2000	37.5	50.0	42.1	3.3	33
Round II Predictions:					
1990	35.0	42.0	39.3	1.6	25
1995	35.0	43.0	40.4	1.5	25
2000	40.0	45.0	41.7	1.6	25

Figure V.5. Slaughter Cattle Marketed in Alberta as a Percentage of Slaughter Cattle Marketed in Canada, Alberta, 1986

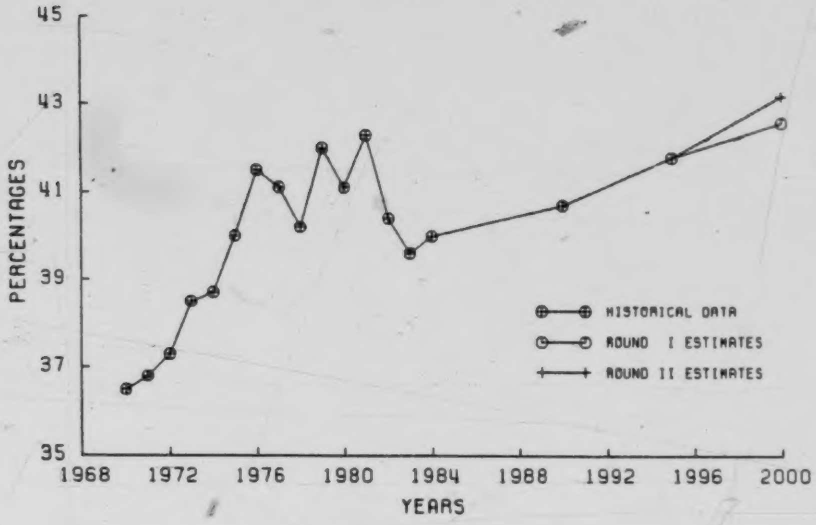

Table V.11. The Panel's Estimates of Alberta's Share in Slaughter Cattle Marketed Nationally, Alberta, 1986

	LOW	HIGH	AVERAGE	ST. DEV.	RESPONSES
Round I Predictions:					
1990	36.0	45.0	40.7	1.6	32
1995	38.0	50.0	41.8	2.4	32
2000	36.0	60.0	42.6	4.2	31
Round II Predictions:					
1990	38.0	45.0	40.7	1.2	26
1995	35.0	50.0	41.8	2.4	26
2000	30.0	60.0	43.2	2.3	26

Figure V.6. Inspected Domestic Slaughter of Cattle in Alberta as a Percentage of Inspected Domestic Slaughter of Cattle in Canada, Alberta, 1986

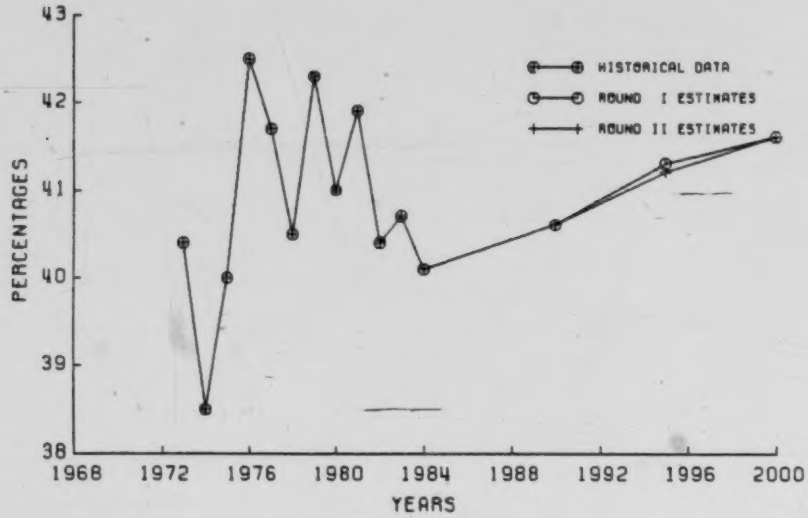

Table V.12. The Panel's Estimates of Alberta's Share in the Canadian Inspected Domestic Slaughter of Cattle, Alberta, 1986

	LOW	HIGH	AVERAGE	ST. DEV.	RESPONSES
Round I Predictions:					
1990	36.0	44.0	40.6	1.6	30
1995	36.0	46.0	41.3	2.2	30
2000	36.0	46.0	41.6	2.8	29
Round II Predictions:					
1990	39.0	44.0	40.6	1.0	25
1995	35.0	46.0	41.2	1.9	25
2000	30.0	47.0	41.6	3.1	25

The panel anticipates steady growth in the contribution of farm cash income from cattle and calves in total farm cash income in Alberta. The level of 32.6 percent was predicted, almost by 2.8 percentage points higher than that for 1984. The prediction of changes for the remaining three variables was also characterized by steady growth in the next 15 years.

The Alberta beef cow herd is expected to increase to 41.7 percent of the national beef cow herd by the year 2000, the highest level in last two decades.

The panel anticipates that 43.2 percent of the slaughter cattle marketed nationally will be of Alberta's origin in the year 2000, 3.2 percentage points higher than in 1984. Alberta is also expected to increase its share of the Canadian inspected slaughter of cattle by 1.7 percentage points to the level of 41.6 percent by the year 2000.

The estimates presented above suggest that Alberta's position in the Canadian beef industry should strengthen with time. Additionally, beef production will not only remain the most important single source of farm cash income in Alberta but an opportunity exists for a further increase in its importance.

(3) Geographical Distribution of the Alberta Beef Industry

The objective of predicting future changes in the geographical distribution of the beef industry within the province was based upon two variables:

1. Feedlot finished cattle in the Southern region as a percentage of total feedlot finished cattle in Alberta.
2. Inspected cattle slaughter in the Southern region as a percentage of Alberta inspected slaughter.

No direct data were available on the numbers of feedlot finished cattle in Alberta. Therefore the data in regard to the marketing of slaughter cattle of grade A classification were applied to approximate feedlot numbers. The data on marketings of slaughter cattle were collected from *Livestock Market Review* publications and *Annual Reports of Edmonton and Calgary Yards* were used to obtain numbers of inspected cattle slaughter.

Two regions were distinguished for the purpose of the study by using Census Divisions. Those regions are as follows:

1. Southern region consisting of Census Divisions 1 to 6
2. North-Central region consisting of the remaining Census Divisions.

Data on both variables was published on Census Divisions basis by the year 1982 and, as a result, respondents were asked to predict additional values for the year 1985.

The results of the analysis of responses to the first and the second round questionnaires are presented in Tables V.13 and V.14. Graphs V.7 and V.8 contain trend lines based upon historical data and the panel's predictions.

The panel predicts a small decrease, by 1 percentage point from the 1982 level, in feedlot finished cattle in the

Figure V.7. Feedlot Finished Cattle in the Southern Region (C.D. 1-6) as a Percentage of Total Feedlot Finished Cattle in Alberta, Alberta, 1986

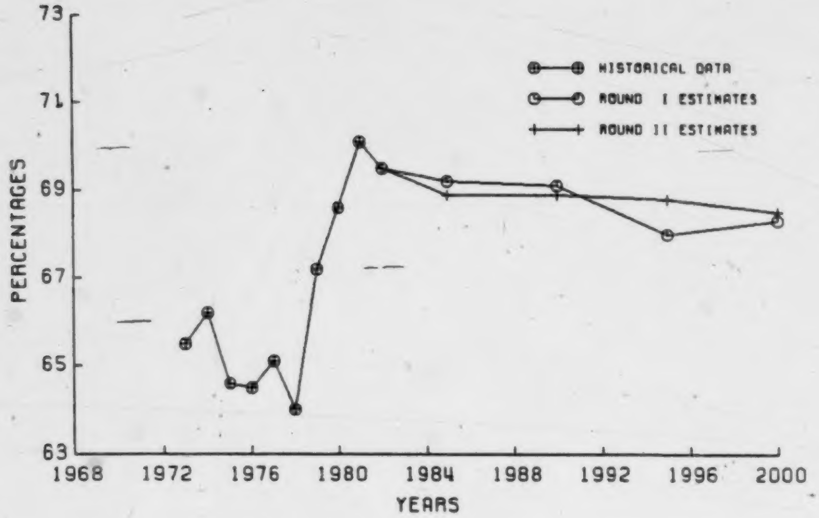

Table V.13. The Panel's Estimates of the Southern Region Share in Feedlot Finished Cattle in Alberta, Alberta, 1986

	LOW	HIGH	AVERAGE	ST. DEV.	RESPONSES
Round I Predictions:					
1985	65.0	72.0	69.2	1.6	31
1990	60.0	76.0	69.1	3.8	31
1995	40.0	80.0	68.0	7.5	31
2000	40.0	82.0	68.3	7.3	29
Round II Predictions:					
1985	65.0	72.0	68.9	1.6	24
1990	60.0	76.0	68.9	3.0	24
1995	55.0	80.0	68.8	4.8	24
2000	55.0	82.0	68.5	5.5	24

Figure V.8. Inspected Cattle Slaughter in the Southern Region (C.D. 1-6) as a Percentage of Alberta Inspected Slaughter, Alberta, 1986

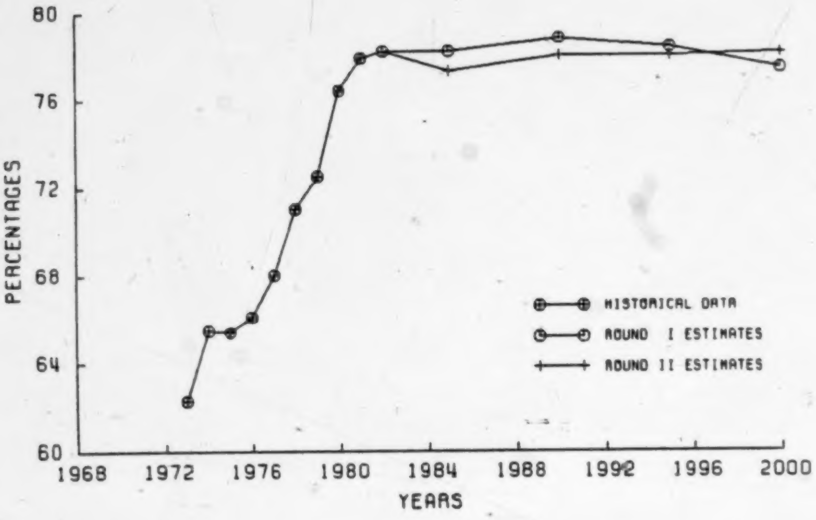

Table V.14. The Panel's Estimates of the Southern Region Share in Alberta Inspected Slaughter, Alberta, 1986

	LOW	HIGH	AVERAGE	ST. DEV.	RESPONSES
Round I Predictions:					
1985	70.0	80.5	78.2	2.2	29
1990	70.0	90.0	78.8	4.1	29
1995	60.0	95.0	78.4	6.1	29
2000	50.0	95.0	77.4	8.3	28
Round II Predictions:					
1985	70.0	80.0	77.3	2.1	23
1990	72.0	82.0	78.0	2.2	23
1995	60.0	90.0	78.0	5.1	23
2000	60.0	95.0	78.1	5.7	23

Southern region. That means that 68.5 percent of cattle feedlot fed in Alberta is expected to be finished in feedlots located in Census Divisions 1 to 6.

The prediction of 78 percent for the inspected cattle slaughter in the Southern region suggests that almost no change should be expected in the distribution of inspected cattle slaughter between both regions.

F. SUMMARY

The panel's predictions of changes in eight variables and the process leading to these predictions were discussed in this chapter. Furthermore, the evaluation process of assumptions underlying the predictions and the final ratings of these assumptions for their importance and validity were presented. This part of the research fulfilled the first four objectives of the study[46].

The review of important and valid assumptions and the panel's predictions led to the following conclusions:

1. The panelists foresee a further increase in exports of Canadian beef to the United States and Pacific Rim countries. This will be achieved by development of new and/or expansion of existing markets in those two regions, despite possible restrictions in the trade of beef between Canada and the United States.
2. The Canadian beef industry is viewed as a mature industry with little chance for rapid growth. The actual

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[46] The list of the study objectives is presented in Chapter I.

growth rate will be determined by the competition from other meats and prospects of lower grain prices.

3. Further structural changes in the form of the exit of less efficient producers can be expected.
4. The panel believes that the issue of the federal Crow benefit will be resolved or neutralized in a way benefiting livestock producers in Western Canada. However, a further interference of government causing distortion of marketing signals and production decisions is feared.
5. The panel indicates that such factors as Alberta's natural comparative advantage, the increasing gap between transportation rates of live cattle and beef to the rest of Canada and the existing overcapacity of slaughtering plants in Alberta would lead to increased importance of the Alberta beef industry. Furthermore, this trend will be supported by additional factors such as: (1) a shift toward mixed grain/beef economy in the West as a result of the rebuilding cycle; and (2) the existence of more production options in Eastern Canada with higher payback from subsidization of other alternatives than beef.
6. The panel does not anticipate changes in the distribution of the Alberta beef industry. Locational factors supporting a further concentration of the industry in the Southern region will be offset by production factors in the North-Central region.

7. Respondents believe that the Canadian human population will continue to age. Thus further changes in consumer preferences are foreseen. It can be expected that a Canadian consumer will tend to buy smaller, convenient servings of lower calorie content.
8. The panel anticipates the implementation of aggressive and innovative advertising and promotion as a mean of increasing competitiveness of beef products.
9. Respondents indicate that preferred beef's flavor, popularity of beef hamburgers, and the alleviation of health concerns associated with beef should favor the increase of beef consumption. Additionally, respondents believe that the poultry marketing board will continue to exist and will protect beef producers from a rapid increase of cheap poultry meat in the Canadian market. On the other hand, increasing popularity of poultry in fast food outlets and decreasing disposable income could affect negatively beef consumption.

VI. TECHNOLOGICAL CHANGES

A. INTRODUCTION

A list of anticipated technological changes at each of the three sectors of the beef industry: producing, processing and retailing, was obtained through the application of an open-ended question in Part B, Section I of the first questionnaire. Thirty-six respondents participating in Round I generated 131 single propositions of possible technological changes in the beef industry within next 15 years. Some of the items represented detailed changes which, in order to secure the flow and simplicity of the second questionnaire, were grouped under common headings. Gathering and synthesizing of all ideas resulted in 25 main headings to be evaluated for their importance to the future of the beef industry and the likelihood of their occurrence. The two scales used were, Importance and Validity. Respondents were as well asked to indicate if they agree or disagree with occurrence of detailed changes listed under common headings. An effort was made to present the technological changes, suggested by respondents participating in the first round questionnaire, as close to the original phrasing to minimize interpretation bias on the part of the author.

Responses to the second round questionnaire were used to calculate medians and the interquartile ranges. Those items which obtained the interquartile range values equal or greater than 1.25 on any of two scales were selected for further evaluation in the third round. Exception was made when the panel agreed (Q<1.25) that given technological change is unimportant or invalid. Those items were not presented in the third round even though consensus was not obtained on the other scale.

In Round III questionnaire respondents were asked to reevaluate nine technological changes after viewing the summary of the group evaluation in the form of low, high and average values.

B. TECHNOLOGICAL CHANGES AT THE PRODUCER LEVEL

The first round questionnaire resulted in 51 single propositions of technological changes at the producer level. The final list of 17 main technological changes, established as a result of the editing process, were presented to respondents in the second round questionnaire for evaluation on importance and validity scales. The second round evaluation process led to: (1) nine items obtaining consensus on both scales; (2) one item, a return to conventional breeds, rated as unimportant; and (3) seven items not obtaining consensus on one or both scales. Those seven items from the third group were presented for the final round of the evaluation process. The third round questionnaire resulted in additional three items obtaining consensus on both scales. Two of them joined the pool of important and valid technological changes. Whereas, the third item, trend to large feedlots with central slaughtering facilities, was rated as indeterminable on both scales.

Through the evaluation process of the second and third rounds, respondents agreed that 11 technological changes are important to the future of the beef industry and will occur by the year 2000. Those technological changes ordered according to their importance score are presented in Table VI.1. Examining Table VI.1, it can be observed that the panel anticipates improvements in reproductive efficiency, health protection, and feeding efficiency. Furthermore, a diversification of agriculture and reduced indebtedness of producers should be expected. Changes in production systems leading to: (1) increased use of forage and residuals in feeding, (2) increased weaning weights, (3) more backgrounding, and (4) the optimization of lean cattle production, are foreseen.

Only one item, a return to conventional breeds, was recognized by the panel as unimportant. The remaining 5 technological changes did not obtain consensus or were rated as indeterminable[47].

The analysis of items grouped under common headings which were evaluated by the panel as important and valid resulted in the following observations.

The majority (65% or more) of respondents agree that:

1. improved management techniques will be the main factor

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[47] Appendixes F and G contain detailed ratings from the second and third round evaluation processes, respectively.

TABLE VI.1. The List of Important and Valid Technological Changes at the Producer Level, Alberta, 1986

CODE	TECHNOLOGICAL CHANGE	IMPOR- -TANCE SCORE	VALI- -DITY SCORE	NO OF ROUNDS
A1	Increase in reproductive efficiency	4.38	4.03	1
A3	Improved health protection	4.32	4.12	1
A2	Improved feeding efficiency	4.29	4.20	1
A5	Optimization of lean cattle production	4.17	3.95	2
A16	Survivors will have more equity and less debt	4.09	3.87	1
A15	Diversification of agriculture by implementing new crops	4.04	3.75	2
A17	Computer programs for cost analysis of cattle feeding	4.00	3.96	1
A8	Increased weaning weights	3.96	3.86	1
A4	Increased use of forage in feeding	3.91	3.55	1
A6	Increased use of residuals of crop production	3.82	3.63	1
A7	More backgrounding	3.62	3.62	1

of increase in reproductive efficiency;

2. improved feeding efficiency will be determined mostly by such factors as the improvement of genetic characteristics, improved feeds and feeding formulas, and increased use of micronutrients;
3. improved health protection will occur due to prevention of shipping diseases, further development of vaccine treatment, control of livestock pests, and improved health management techniques;
4. factors such as the development of new more productive and/or higher nutritional quality variety forages, new methods of harvesting and preserving forage quality, increased use of forages in crop rotations, improved range and pasture management practises, and a reduction in losses due to bloat, will lead to increased use of forage in feeding; and
5. optimization of lean cattle production will be achieved mainly due to cross breeding, and feeding and slaughtering of bulls.

C. PROCESSING AND RETAILING SECTORS

The first round questionnaire resulted in a list of 48 possible technological changes at the processing level and 32 at the retailing level. The editing process resulted in 8 main common headings which appeared in the second round questionnaire for the evaluation process. The second round evaluation process led to six technological changes obtaining consensus on both scales. Four of them were rated at least as important and valid, one as unimportant, and another, blending meats from different species into specialty hamburgers, as indeterminable on both scales. Only two headings were presented in Round III questionnaire for the final evaluation process. As a result, one heading joined the pool of important and valid technological changes and another did not obtain consensus on the validity scale.

Table VI.2 contains the list of important and valid technological changes at the processing and retailing levels. Change in product design and packaging was rated as a very important technological change which will occur by the year 2000. Additionally, the panel agrees that such technological changes as: (1) a further rationalization of packing plants; (2) a development of an objective method for determining carcass value; and (3) changes in processing techniques; are valid and important technological changes to the future of the beef industry. On the other hand, the purchase of meat directly from home by computer was rated as an unimportant technological change of high possibility of occurrence to the year 2000.

The analysis of responses to items listed under common headings rated as important and valid led to the following conclusions.

The majority (65% or more) **of respondents agree that:**

1. (a) Mechanization of unloading and loading beef carcasses; (b) lowering of stress impact on animals to

TABLE VI.2. The List of Important and Valid Technological Changes at the Processing and Retailing Levels, Alberta, 1986

CODE	TECHNOLOGICAL CHANGE	IMPOR- -TANCE SCORE	VALI- -DITY SCORE	NO OF ROUNDS
A21	Changes in product design and packaging	4.54	4.06	1
A18	Further rationalization of packing plants	4.31	4.22	1
A19	Development of objective method of determining carcass value	4.24	4.00	1
A20	Changes in processing techniques	4.21	4.05	1

be slaughtered; (c) laser cutting of beef; (d) the development of a use for paunch residue; (e) the development of system for extracting organic matter from waste water; and (f) a universal identification system for live cattle to link up grade information with the farm of origin; are the main factors of a further rationalization of packing plants.

2. Development of an objective method for determining carcass value will be determined by such factors of change as, (a) electronic grading; (b) fuller description of carcass; and (c) new methods of measuring tenderness.

3. Changes in processing techniques will take the form of (a) more fat trimmed at the processor level; (b) an increase in centralized cutting; (c) aging primal and subprimal cuts in vacuum packages; (d) new tenderization techniques; (e) increased use of restructured products; (f) maintaining attractive colors of meat; (g) an increase in frozen beef products; (h) extensive deboning of beef products; and (i) an elimination of dark cutters.

4. Changes in product design and packaging will be determined by such factors as, (a) small servings; (b) convenience: "easy to prepare" and/or "ready to eat"; (c) the extended shelf life; (d) a "healthier" leaner product; (e) the improved appearance and consumer appeal of products; (f) more uniformity; (g) name branding of

beef products; (h) and labeling of beef products with nutritional information and cooking ideas.

5. The trend to locate processing plants in rural areas will not be a factor in the rationalization of packing plants within Alberta.

The remaining items did not achieve a high level of agreement among participants or were not rated as important, and are not cited here.

D. SUMMARY

The results of the two round evaluation process of technological changes at each level of the beef industry were presented in this chapter. The process of developing the list of possible technological changes was outlined and the final ratings of these changes for their importance and validity were presented. This part of the project fulfilled the fifth objective of the study stated in Chapter I.

The panel of experts indicates that the main technological changes at the producer level will take the form of a further adoption of available technology rather than the form of major technological breakthroughs. They believe that important industry improvements will take place in reproductive and feeding efficiency, and health protection. Those improvements will result from improved management techniques, further improvements in genetic material, and balanced feeding rations. Furthermore, the prevention of shipping diseases and a further adoption of vaccine treatment is expected. Respondents as well indicate that increased use of forage in feeding and higher production of lean cattle are technological changes important to the industry and should occur by the year 2000. Finally, the panel agrees that: (1) changes in production methods leading to increased weaning weights and more widespread backgrounding; and (2) structural changes resulting in higher equity ratio of surviving operations; are important and valid.

The technological changes outlined above should result in a more efficient and cost conscious industry.

Similarly as for the production sector, a further adoption of available technology will be the main source of technological advancement for the processing and retailing sectors. The panel indicates that a further rationalization of packing plants and changes in processing techniques would have an important influence on the packing sector and would take place by the year 2000. Furthermore, the development of an objective method of determining carcass value is foreseen as important and valid.

The important technological changes expected at the retailing level are directly connected with changes in product design and packaging. The technology applied to other meats, especially to poultry, is anticipated to be adapted to beef products in the form of consumer appealing, smaller, convenient, name branded products with extended shelf life, containing nutritional information and cooking ideas.

The list of important and valid technological changes at processing and retailing levels suggests that the future will bring an industry which is more consumer oriented and more responsive to the challenge from meats of other species.

VII. GOVERNMENT PROGRAMS

A. INTRODUCTION

The second part of the first questionnaire was utilized to obtain the list of government programs and policies which were viewed by the panel as necessary in the Alberta beef industry. Participants were asked to state issues and corrective actions they believed should be considered in future programs/policies at each of three sectors of the beef industry by policy makers. As a result, a pool of 97 single ideas was established. The editing process based upon the same principals as presented in previous chapters led to 52 common headings grouped into 5 main subgroups of programs:

1. programs at the producer level;
2. programs at the processor level;
3. programs at the retailer level;
4. programs regarding the trade; and
5. programs regarding research and its direction.

Those 52 items were presented to the panel of experts for evaluation on desirability and feasibility scales. Desirability scale was used to determine if a proposed program is important to the industry and will have a positive effect on the industry. In order to evaluate the ease of implementation a given program the feasibility scale was applied. Responses to the second round were used to calculate medians and interquartile ranges for each common heading on both scales. Twenty-one headings obtained consensus and one item was rated infeasible in the second round. Three items had to be dropped from the study due to errors which occurred in the analysis phase of the study. The remaining 27 headings were repeated in the third round for the final evaluation process. Each item was accompanied by feedback information in the form of mean, low and high values calculated from the panel's responses of the second round. The reevaluation process of the third round resulted in additional 10 programs moving to the pool of desirable and feasible programs. Handling of responses was the same as for the round two questionnaire.

B. PROPOSED PROGRAMS AT THE PRODUCER LEVEL

A pool of 31 different policy issues was generated by the panel in the first round questionnaire. The editing process led to 15 common headings being presented to the panel for evaluation. The analysis of responses to that round resulted in 6 programs obtaining consensus on both scales. Four of those six headings were rated as desirable and feasible. Additionally, a proposal to increase infrastructure development was evaluated as indeterminable on both scales. Whereas, a proposal of discontinuing or reforming policies leading to cropping of the marginal land was rated as desirable with indeterminable feasibility. The remaining headings, except one discarded, were presented for the final evaluation process of the third round. As a result, additional three items joined the list of desirable and feasible programs at the producer level. One proposal that, in and out producers should be excluded from benefits such as tax write offs, subsidy, etc, was evaluated as indeterminable on both scales. On the other hand, the proposal of subsidizing production to ensure utilization of existing processing capacity in Alberta was recognized by the panel as undesirable. The calls for reducing input taxes instead of price supports and stopping excessive loss insurance programs which are in reality subsidy programs were evaluated as desirable; however, the panel could not reach consensus on their feasibility.

Table VII.1 presents the list of desirable and feasible programs ordered according to its desirability score. The call for not implementing new programs leading to the distortions of marketing signals was rated as very desirable and feasible. The proposition of developing program supporting the conservation of land resources was the second highest rated item on the desirability scale. The remaining 5 items, presented in Table VII.1, were rated as desirable and feasible. They included such proposals as, (1) correct distortions created by programs already implemented; (2) ensure that Western Grain Transportation subsidies will be paid to producers; (3), create an income stabilization trust provision in the tax law, which farmers can use as their option; (4) allow for asset transfer from financially troubled producers, do not support moratoriums and debt

TABLE VII.1. The List of Desirable and Feasible Government Programs at the Producer Level, Alberta, 1986

CODE	PROPOSED PROGRAM	DESIRA- -BILITY SCORE	FEASI- -BILITY SCORE	NO OF ROUNDS
E 2	Do not implement new programs leading to distortion of marketing signals	4.65	3.81	2
E10	Develop program supporting the conservation of land resources	4.50	3.98	1
E 1	Correct the distortions created by programs already implemented	4.39	3.66	2
E 6	Ensure that Western Grain Transportation subsidies will be paid to producers	4.33	3.74	1
E15	Create an income stabilization trust provision in the tax law, which farmers can use at their option	4.14	3.78	2
E12	Allow for asset transfer from financially troubled producers; do not support moratoriums and debt write downs	4.00	3.54	1
E 4	Promote an uniform stabilization program	3.88	3.57	1

write downs; and (5) promote an uniform stabilization program.

C. PROPOSED PROGRAMS AT THE PROCESSOR LEVEL

Fourteen common headings were generated from the list of 25 single items proposed by the panel in the first round. The second round evaluation process resulted in the list of only two programs being rated as desirable and feasible. Remaining items, except one discarded, were presented in the third round for additional evaluation based on the feedback from the previous round. As a result, the pool of desirable and feasible programs at the processor level was enriched by additional three items. Proposed programs which were evaluated as desirable and feasible are presented in Table VII.2 in descending order of desirability score. None of the proposed programs was rated either as very desirable or very feasible. All five items presented in Table VII.2 were rated very closely and they are as follows, (1) allow obsolete plants to close; (2) base payment on edible red meat content; (3) ensure competitive atmosphere among plants; (4) ensure more effective use of existing inspectors and veterinary personnel in order to build up consumer confidence in quality of beef products; and (5) reduce the cost recovery from grading since the quality assurance is also a benefit to consumer.

The proposal of improving price discovery between processors and retailers was evaluated as desirable with

TABLE VII.2. The List of Desirable and Feasible Government Programs at the Processor Level, Alberta, 1986

CODE	PROPOSED PROGRAM	DESIRA- -BILITY SCORE	FEASI- -BILITY SCORE	NO OF ROUNDS
E26	Base payment on edible red meat content	4.24	3.80	2
E18	Allow obsolete plants to close	4.23	3.89	1
E20	Ensure competitive atmosphere among plants	4.20	3.83	1
E24	Ensure more effective use of existing inspectors and veterinary personnel in order to build up consumer confidence in quality of beef products	4.10	3.75	2
E29	Reduce the cost recovery from grading since the quality assurance is also a benefit to consumer	4.04	3.70	2

feasibility rated as indeterminable. Additionally, the call for introducing "open shop" legislation in order that employees have choice as to whether to belong to the union or not, was evaluated as desirable. However, consensus was not obtained for its feasibility score.

D. PROPOSED PROGRAMS AT THE RETAILER LEVEL

Responses to Round I open-ended question resulted in the list of 19 single items. Editing process preceding the design of the second questionnaire led to seven common headings to be rated for their desirability and feasibility. Two items obtained consensus as a result of the second round evaluation process. One item was rated as desirable and feasible, and the another as infeasible. Remaining five headings were presented to respondents for the final round of the evaluation process. Another two items were classified as desirable and feasible. As a result of two round evaluation process such programs as:

1. implementation of government control over beef product prices at the retailing level in order to prevent excessive margins; and
2. creation of stable price for beef products at the retailing level;

were recognized by the panel as infeasible.

Table VII.3 presents such three proposals as, (1) encourage new marketing strategies for beef products; (2) encourage cooperation among all sectors in order to remove

TABLE VII.3. The List of Desirable and Feasible Government Programs at the Retailer Level, Alberta, 1986

CODE	PROPOSED PROGRAM	DESIRA- -BILITY SCORE	FEASI- -BILITY SCORE	NO OF ROUNDS
E30	Encourage new marketing strategies for beef products	4.50	4.03	1
E34	Encourage cooperation among all sectors in order to remove unnecessary costs and increase profits of all sectors	4.28	3.73	2
E36	Ensure competitive atmosphere among retailers	4.28	3.67	2

unnecessary costs and improve profits of all sectors; and (3) ensure competitive atmosphere among retailers; which were rated as desirable and feasible.

E. PROGRAMS CONCERNED WITH TRADE OF CATTLE AND BEEF PRODUCTS

Proposals which dealt with the trade issues, not exclusively related to any sector of the beef industry, established a pool of 8 programs concerned with the trade of cattle and beef products. Five final headings were obtained through the editing process and those headings were presented in the second round for the evaluation process. Four programs were rated as very desirable and feasible in the second round evaluation process. And the last heading reached desirability and feasibility status during the final round of the evaluation process. Table VII.4 contains five programs evaluated as desirable and feasible according to descending desirability score. These programs are as follows:

1. Ensure access to other provinces.
2. Increase the emphasis on development of new markets and/or expansion of already existing.
3. Promote international negotiations in order to keep health standards as much uniform as possible.
4. Sponsor freer trade with the United States.
5. Protect from unfair competition.

TABLE VII.4. The List of Desirable and Feasible Programs Concerned with the Trade of Cattle and Beef Products, Alberta, 1986

CODE	PROPOSED PROGRAM	DESIRABILITY SCORE	FEASIBILITY SCORE	NO OF ROUNDS
E37	Ensure access to other provinces	4.68	4.09	1
E40	Increase the emphasis on development of new markets and/or expansion of already existing	4.58	4.14	1
E41	Promote international negotiations in order to keep health requirements as much uniform as possible	4.55	3.85	1
E39	Sponsor freer trade with USA	4.55	3.83	1
E38	Protect from unfair competition	4.40	3.89	2

F. PROGRAMS CONCERNED WITH RESEARCH AND ITS DIRECTION

Proposals which dealt with research matters, not exclusively attached to any sector of the beef industry, established the group of programs concerned with research and its direction. Eleven common headings were generated through the editing process of 14 items presented by the panel. The first round evaluation process resulted in the list of eight items being rated at least as desirable and feasible. Two items were dropped from the study due to errors which occurred in the analysis phase of the study. The remaining two items were presented for the final round of the evaluation process. Only one of those two items obtained consensus.

Table VII.5 presents the proposed programs which were rated as desirable and feasible in order of decreasing desirability score.

Such proposals as:

1. support or facilitate efforts to present medically correct facts to the public regarding health aspects of beef as a food;
2. support or facilitate efforts to present medically correct facts to the public regarding dietary aspects of beef as a food; and
3. help to develop new beef products meeting consumer preferences;

were rated as very desirable and feasible. The remaining six proposals, presented in Table VII.5, called for (1) an

TABLE VII.5. The List of Desirable and Feasible Programs Concerned with Research and Its Direction, Alberta, 1986

CODE	PROPOSED PROGRAM	DESIRA- -BILITY SCORE	FEASI- -BILITY SCORE	NO OF ROUNDS
E51	Support and facilitate efforts to present medically correct facts to the public regarding health aspects of beef as a food	4.65	4.50	1
E52	Support and facilitate efforts to present medically correct facts to the public regarding dietary aspects of beef as a food	4.63	4.42	1
E46	Help to develop new beef products meeting consumer preferences	4.61	4.11	1
E42	Increase government funding	4.50	3.80	1
E44	Test animal health aids and growth stimulants for any residual effects before allowing industry to implement them	4.42	4.03	1
E45	Develop efficient non-freezing beef storage technique	4.35	3.65	2
E49	Improve the transfer of technology (improve the extension effort)	4.28	4.06	1
E48	Support university and graduate student research training	4.22	4.20	1
E43	Ensure producer involvement in research projects	4.21	4.00	1

increase of government funds for research; (2) an improvement of technology transfer; (3) testing animal health aids and growth stimulants for any residual effects before allowing industry to implement them; (4) a development of efficient non-freezing beef storage technique; (5) a support of university and graduate student research training; and (6) an assurance of producer involvement in research projects.

Finally, the proposal of promoting central coordination of government funds and facilities was viewed as desirable. However, agreement on its feasibility could not be reached.

G. SUMMARY

The process leading to evaluation of the proposed programs and policies on desirability and feasibility scales was discussed in this chapter. Furthermore, the final list of desirable and feasible programs at each level of the beef industry was presented. Additional two classifications of programs: (1) programs concerned with the trade of cattle and beef products; and (2) programs concerned with research and its direction; were established to account for policy proposals not exclusively connected with any of three sectors. This part of the project fulfilled the sixth objective of the study presented in Chapter I.

The analysis of programs listed as desirable--and feasible at the producer level suggests the following:

1. The panel would like to preserve marketing signals by

correcting current and by not implementing future programs of distorting nature.

2. Respondents agree that a further promotion of national uniform stabilization program is necessary.
3. Changes in tax laws should allow for income stabilization as a producer option.
4. The panel recognizes the need for a program supporting conservation of land resources.
5. The panel disagrees with moratoriums and debt write downs.

The list of desirable and feasible programs at the processing level was used as a basis for drawing the following conclusions:

1. The panel is concerned with price efficiency in the marketing system, calling for (a) the assurance of a competitive atmosphere among plants; (b) the improvement of price discovery between processors and retailers; and (c) basing the beef carcass payment on edible red meat content.
2. The panel agrees that the existing inspectors and veterinary personnel should be used more effectively to build up consumer confidence in quality of beef products. Furthermore, respondents indicate that due to the fact that the quality assurance is also a benefit to consumer the cost recovery from grading should be reduced.
3. The panel expressed its concern with operational

efficiency of the system by suggesting that obsolete packing plants should be allowed to close.

The analysis of desirable and feasible programs at the retailer level resulted in the following observations:

1. The panel agrees that the cooperation among all sectors in order to remove unnecessary costs and increase profits of all sectors is required.
2. The panel expresses its concern with competitiveness of beef products by calling for encouragement of new marketing strategies for beef products.
3. Respondents recognize the importance of price efficiency by proposing a program ensuring a competitive atmosphere among retailers.
4. The panel discards proposals of government control of retail prices by rating them as infeasible.

All policy proposals classified as programs concerned with the trade of cattle and beef products were rated at least as desirable and feasible. The panel agrees that the access to other provinces and the United States should be ensured. Furthermore, the panel calls for the development of new and an expansion of existing markets. Finally, respondents recognize the need for protection from unfair trade practises and standardization of health requirements.

The analysis of desirable policy proposals concerned with the research led to the following conclusions:

1. The panel recognizes the need for building up consumer trust in beef products by: (a) sponsoring research

revealing the current and medically correct information about the Canadian beef; and (b) testing animal health aids and growth stimulants for their residual effects before allowing the industry to implement them.

2. The panel expresses its concern with effectiveness of research effort by recommending, (a) a further increase of government funds; (b) a support of university and graduate students research training; (c) a central coordination of government funds and facilities; (d) an increased participation of producers in research projects; and (e) the improvement of technology transfer.
3. The panel agrees that the industry should be offered the help in (a) the development of new storage techniques for beef products; and in (b) the development of consumer oriented products.

VIII. CONCLUSIONS AND RECOMMENDATIONS

A. STUDY OVERVIEW

This study was designed to meet the following six objectives:

1. To predict the changes in absolute and relative levels of beef consumption.
2. To forecast changes in importance of the beef industry at the farm level.
3. To estimate possible changes in the contribution of Alberta to the national beef industry.
4. To predict changes in geographical distribution of cattle finishing and slaughtering within Alberta.
5. To establish the list of possible technological changes in the beef industry and rate them for their importance and likelihood of occurrence.
6. To develop a list of government programs and policies required by the beef industry and evaluate them for their desirability and ease of implementation.

In addition, short overview of the structure of the Canadian beef industry, with some references to Alberta and the discussion of importance of the Alberta beef industry were provided.

A literature review of recent studies on application of the Delphi method, with emphasis placed on the design of those studies, was also undertaken. Furthermore, the main results and recommendations of the selected studies concerned with the beef industry, carried out on national and provincial levels, were presented.

The main objectives of the study were met through the systematic questioning of industry experts and the analysis of their opinions and predictions.

B. FULFILLMENT OF OBJECTIVES

The first four objectives dealt with predictions of changes in (1) beef consumption in Canada, (2) the importance of the Alberta beef industry, and (3) the geographical distribution of the industry within the province. A consideration of these objectives was accomplished through the application of two questionnaires. A list of assumptions underlying these predictions was generated in Round I and these assumptions went through an evaluation process in the second and the third round questionnaires which resulted in a final listing of important and valid assumptions. In the second round questionnaire the assumptions were used as opinion feedback to supply respondents with:

a. factors they might have neglected inadvertently, and
b. factors they have dismissed as unimportant on first thought.

The t test for difference in means showed that the final panel's predictions were significantly different from those of Round I. Thus, it can be concluded that assumptions played a role in affecting those estimates and are an addition to presented predictions.

The fifth objective of the research was to establish a list of possible technological changes in the beef industry and rate them for their importance and likelihood of occurrence. In meeting this objective all three questionnaires were employed. The first questionnaire resulted in a raw list of anticipated technological changes which was edited and presented in the second questionnaire to be evaluated on both scales, Importance and Validity. Round III questionnaire was used to obtain the final ratings upon the review of the second round results. As a result, the list of important and valid technological changes was obtained.

The sixth objective was to develop a list of government programs and policies required by the beef industry and evaluate them for their desirability and ease of implementation. This task was accomplished through the application of all three questionnaires. The first questionnaire, followed by the editing process, led to a list of programs to be presented in the second round for the evaluation process. The third round questionnaire was employed to generate ratings upon the review of feedback from the second questionnaire. As a result, the list of desirable and feasible programs at each level of the beef industry was obtained.

Although each chapter presenting results has already been summarized, some concluding comments are presented below in order to help tie the major observations of this research project together.

Firstly, the panel feels that consumption of meat should stabilize at the level of 202 lbs per capita by the year 2000. Furthermore, a decrease in beef consumption is expected. However, this trend could be neutralized by the industry and government effort at the end of the 20th century.

Secondly, the panel anticipates that Alberta's position in the national beef industry will strengthen. The importance of the beef industry as the source of farm cash incomes in Alberta is expected to increase.

Thirdly, the main technological advancement at all sectors of the beef industry will be based primarily upon a widespread adoption of existing on-the-shelf technologies. Some breakthroughs in the areas of disease eradication, improved forage productivity, parasite control, and improved processing techniques are expected by the year 2000.

Finally, the following general observations can be made in the area of government policy requirements:

a. The panel agrees that the government policies should not affect marketing signals and should not in any event act against the forces of comparative advantage.

b. The panel agrees that government policies should ensure a competitive atmosphere among processors and retailers.

c. The need for government help in areas of (1) the encouragement of new marketing strategies, (2) building up consumer trust in beef products, and (3) the development of consumer oriented products and storage techniques, was recognized.

d. The panel agrees that (1) an access to provincial and the U.S. markets should be ensured, and (2) a further expansion of existing and development of new markets should be supported.

C. LIMITATIONS OF THE STUDY

No methodology available for research purposes is perfect; the application of any methodology has its advantages and disadvantages. The choice of a methodology depends on a number of factors such as available resources (time, money, equipment, and human resources), objectives of the study, type of study, etc. Some advantages and disadvantages connected with the application of the Delphi method were outlined in Chapter III. The reader is advised to refer to cited references for a further discussion of pros and cons associated with the application of the Delphi method, and theory underlying those arguments. It is beyond the scope of this section to provide such discussion. This part of Chapter VIII was written in order to present weaknesses related solely to the research project.

The following list of limitations related to the research project was established.

1. The main objective of the study was to predict the state of the Alberta beef industry at the end of the 20th century and to recognize policies which would assure viability of this industry. However, the research project could benefit from being conducted as two separate studies, such that one study would be concerned with a prediction of changes in selected variables and the other would be concerned with policy matters. That approach would result in shorter questionnaires and could lead to an increase in response rate. On the other hand, it was noticed that some policy proposals flowed directly from previously stated assumptions. Thus, the study combining both predictions and policy matters, could foster additional assumptions and proposals, which would otherwise not be thought about.
2. The study was conducted on a part-time basis due to student duties the author was responsible for.
    a. Thus, the time span between subsequent questionnaires was longer than could have been if the study was conducted on a full-time basis. The long period between subsequent questionnaires could have resulted in lower response rates in Rounds II and III of the study.
    b. Five calculation errors which occurred in the analysis phase could have been avoided if the study was conducted on a full-time basis. However, it should be remembered that these five items discarded

during the study constituted only 2.6 percent of all assumptions and policy proposals presented for the evaluation process.

3. The intention of the author was to establish equally represented panel of experts. Whereas the balanced panel was achieved, the response rate differed among subpanels of respondents. The average response rate throughout the study was the highest for consumers and government employees at the level of over 90 percent, and the lowest for producers at the level of 41 percent. Thus, despite the initially balanced panel the results could be biased due to unequal representation of each subpanel in the evaluation process.

D. RECOMMENDATIONS

This study was undertaken in order to predict the state of the Alberta beef industry in the year 2000 and to identify policies which would assure viability of this industry. The application of the Delphi method for the purposes of this study has been one of the first steps toward adoption of this methodology for solving agricultural issues. Thus, the recommendations presented below deal not only with results of the study but as well with the study design.

(1) Recommendations Related to the Study Results

The review of final results generated by the study leads to the following recommendations:

1. The optimism of the panel of experts about the future of the Alberta beef industry is based upon assumptions that national and provincial government actions will not lead to a further distortion of marketing signals and will not inhibit comparative advantage of the Alberta beef industry. Therefore, the government of Alberta should realize that, in order to enjoy economic activity generated by beef production, its assistance in ensuring the competitiveness of the provincial beef industry is essential.
2. The sales of beef products has suffered from a widespread consumer belief that beef is not as healthy as other meats. Therefore, a further support in presenting to the public medically correct information about beef as a food is needed.
3. The beef industry, in general, showed a slow tempo of adoption of new technology. An improvement in technology transfer and an assistance in the development of consumer oriented products are needed.

(2) Recommendations Related to the Study Design

The success of the Delphi method is directly related to the quality of the selected sample and the study design. The following recommendations arose through the author's experience with the methodology:

1. Data processing procedures, throughout all rounds of the Delphi method, should be prepared before the user decides on the final design. This would allow for a further understanding of the problems inherent in the design of the first questionnaire and its impact on following rounds.
2. Adequately trained personnel should be used in the editing and analyzing process in order to reduce the time span between questionnaires. This will maintain the panel's interest and ensure adequate information flow.
3. The use of the nominating process for candidate selection should increase chances of selecting highly motivated, knowledgeable respondents.
4. The use of personal contact, support of recognized institutions, agencies, and associations, should all lead to proper motivation of the panel's members.
5. A pretest of each questionnaire will help to avoid ambivalent wording and improve the final design of questionnaires.
6. In a situation when the study requires a sample based upon the balanced representation of different subgroups of respondents, the historical pattern of responses for

each subgroup should be taken into account during the sample selection. Subgroups known for a poorer response rate should constitute higher percentage of the initial sample. This will allow to maintain the balanced sample throughout the study.

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Appendix A

The List of Main Conclusions and Recommendations Presented by Commission of Inquiry into the Marketing of Beef

1. Basic Conclusions[48]:

THE BEEF MARKETING SYSTEM

1. Consumers do not receive adequate or even accurate information of the grade and cut of beef they purchase at the retail counter.
2. The market information—reporting system is insufficient, inaccurate, fragmented, and unresponsive to change.
3. The marketing system has, because of a number of constraints, been unprogressive in some important areas.
4. The marketing system has been reasonably effective in ensuring adequate supplies of beef for Canada's growing population and the Commission is satisfied producers in Canada have responded to the growth in consumer demand.
5. The assurance of a wholesome supply of beef to the retail counter has not been as effective as it might be.
6. There are serious inequities in the prices producers receive for live cattle of the same quality in the same market. These inequities occur regardless of how the producer sells his animals or the region in which they are sold.
7. There are important inequities in the live and carcass beef prices paid, respectively, to producers and packers in different regions of the country. Some of these inequities are more pronounced for lower grade animals- and for heifers.
8. The marketing system has generated unjustified price discrimination against some classifications of beef produced in Canada.
9. The lack of uniformity in names of beef cuts and the absence of grade identification at the retail counter make accurate price comparisons difficult if not impossible.
10. Consumers in Western Canada suffer from serious retail price inequities.
11. If carcass beef processing continues to be done by retailers, this will inhibit the more important gains that can be made in the marketing system for the future.
12. There are unnecessary costs in the marketing system.
13. The live to wholesale price spreads vary significantly by grade and show substantial regional differences. Wholesale to retail price spreads vary greatly within markets and by region.

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[48] Commission of Inquiry into the Marketing of Beef, 1976, p. xi-xiii.

14. While, on average, a reasonably constant share on the consumer's dollar goes back to the producer, it is significantly less than the 75% that has been reported by some agencies.
15. Producers do not seem to have chosen the most economical method of marketing their animals for slaughter.
16. The receipt of part of the saving in the form of a freight rebate by the wholesaler in Montreal is in fact a hidden increase in his commission which distorts the reported carcass market price in Montreal.
17. Freight rates are not a significant deterrent to the location of packinghouse activity in Western Canada. The Feed Freight Assistance Act is not a factor in the interregional aspects of beef production. The fuller utilization of existing facilities and the opportunity to develop a stable beef finishing and processing industry in the West is placed in jeopardy by the dramatic spread that now exists between the Crow's Nest Pass rates and all other transport costs.

THE VEAL MARKETING SYSTEM

18. The live calf marketing system is not performing as effectively as desired. The conclusions with respect to health standards, market information, costs and price spreads in the beef marketing system also apply to the veal marketing system.

2. Recommendations[49]:

THE BEEF MARKETING SYSTEM

1. The Commission rejects the principle of regulated domestic production for beef and veal. The real equity and income problems faced by beef producers should not be solved by controls on production.
2. The output of all packinghouses in Canada should be processed at least to the sub-primal stage and boxed at the point of slaughter and early action should be taken by government to reverse the current trend to growth in central processing by retailers.
3. Retailers should be required to clearly label the grade of beef on the packaged beef cuts sold at their retail counter and clearly state that

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[49] Commission of Inquiry into the Marketing of Beef, 1976, p. xiii-xv.

grade of beef in any form of advertising they use.

4. There should be an integrated set of national meat inspection standards developed jointly by the Federal and Provincial governments.
5. The identification of carcasses for railgrade payment to producers should be subject to government supervision, all weighing of railgraded carcasses should be carried out by independent bonded weigh masters not in the employ of the packer, and differentials in conformity with physical and market criteria should be determined for the purpose of final payment to producers.
6. Arrangements should be made so that all packers purchase all animals for slaughter exceeding some established minimum weight, perhaps 700 lbs. liveweight, for immediate payment on an official railgrade and weight basis.
7. Teletype auctions for the purchase of all slaughter animals exceeding an established minimum weight, perhaps 700 lbs. liveweight, for payment on an official railgrade and weight basis should be introduced at least in Alberta, Saskatchewan, Manitoba and Ontario.
8. The terminal stockyards (except the one in Regina) should be closed. Better located public assembly points for live animals should be established. All auctions in Canada for the sale of animals on a liveweight basis should be classified into two groups:
    a. those with 20,000 or more cattle, calf or cow marketings per annum which would be designated public markets subject to a revised set of national regulations under the Livestock and Livestock Products Act; and,
    b. those with less than 20,000 cattle, calf or cow marketing per annum which would continue to be subject to Provincial jurisdiction.
9. The Federal Government should develop a comprehensive, consistent market information collection system employing modern techniques for the distribution of this information to the widest group of participants and users possible. The Federal Government should leave the field of market forecasts to private agencies but be prepared to help finance those interest groups who prepare such market analysis for general information.
10. All freight rebates paid by packers to wholesalers in Montreal should cease.
11. The principle of statutory tariff quotas is rejected by the Commission. The existing Export

and Import Permits Act provides all the latitude and authority necessary to safeguard the Canadian market from undue supply and demand forces or from sudden policy changes in other countries.

12. The Canadian Government should press for reciprocity with the U.S.A. in the tariff levels applied to all live cattle, calves, fresh and frozen beef and veal.
13. A common code or set of health standard for cattle and beef should be developed among Canada's main trading partners, particularly with the U.S.A.
14. The deferral of capital gains tax, as it now applies to the family farm, should be extended to cover family farming corporations.
15. A taxpayer's income from a farming business should be included in the list of items which would qualify an amount as a deductible payment for an income averaging annuity.

THE VEAL MARKETING SYSTEM

16. While there should be improvements in the regulation of the numerous small auction markets in Canada, there should be no direct move to concentrate them into fewer bigger units.
17. The marketing of veal calves should be made more effective by improving the existing mechanisms of terminal and country auctions and by improving the scope and integration of health inspection standards, as described in Chapter 11.
18. Retailers should make a greater contribution to consumers' wants and to the veal producers' market by extending their efforts to create a better demand for veal. Recent experience with such promotions in Western Canada should be followed.
19. The veal producer should be encouraged to increase the output of milk-fed veal by making milk powder available at the same price it would obtain in the export market.

Appendix B

A Copy of Round I Questionnaire

SECTION I: Beef Industry 2000

PART A:

This part of Section I consists of 8 questions concerned with future changes in the beef industry. Each question consists of background information on the item of interest (in the form of a table and a graph) and four subquestions.

After viewing values for the last 9-14 years (depends on the item), please answer the four following subquestions.

a. *Your prediction* - please state the values YOU believe will prevail for the given years.

b. *How reliable do you consider YOUR prediction to be?* - please X-mark the level of reliability YOU attach to your prediction on the given reliability scale.

c. *What key developments (your assumptions) did you assume in making your prediction* - please use point form to answer this subquestion. If the area provided is not sufficient use the other side of the page.

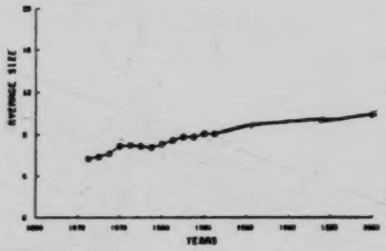
d. *What other developments (your uncertainties) not considered above might result in major revisions in your prediction* - please answer by using point form. If the provided area is not sufficient, please use the other side of the page.

ATTENTION:

1. You may find it helpful to chart YOUR projections in the space provided to the right of each graph.
2. Please refer to the EXAMPLE below before you proceed with answering the questions.

The average size of the privately owned farm in Poland.

Years	Size (ha)
1972	5.7
1973	5.9
1974	6.2
1975	6.9
1976	7.0
1977	6.9
1978	6.8
1979	7.1
1980	7.5
1981	7.8
1982	7.8
1983	8.1
1984	8.1



a. *Your prediction* - please state below the values YOU believe will prevail in the following years:

1990 = 9.0 ha. 1995 = 9.6 ha. 2000 = 10 ha.

b. *How reliable do YOU consider YOUR prediction to be?*

····►·········►·····►···increasing reliability of estimate··········►·······►······►

0 10 20 30 40 50 60 70 X 80 90 100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction? (Please list them below).*

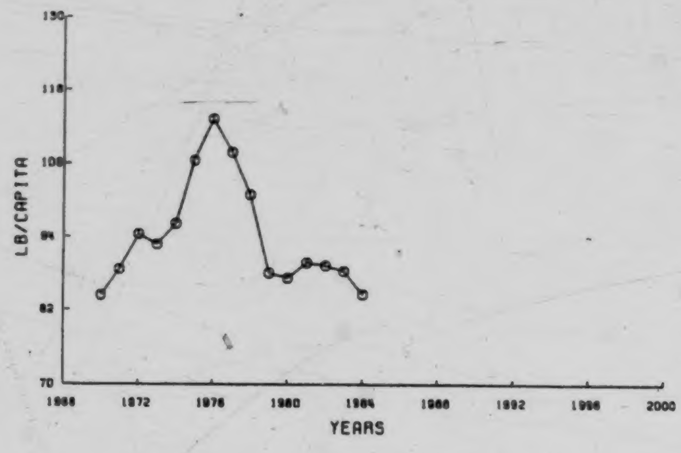
- THE NEW RETIREMENT POLICY ENCOURAGING THE SALE OF FARMS TO PRIVATE OPERATORS
- THE INCREASING SUPPLY OF INPUTS SUCH AS COMMERCIAL FEED, MACHINES AND TRACTORS WITHIN NEXT 10 YEARS WILL CREATE A NEED FOR EXPANSION OF THE SIZE OF AN AVERAGE FARM
- THE RECENT GOVERNMENT LOAN PROGRAM FOR THE PURCHASE OF LAND AND BREEDING STOCK WILL SPEED UP THE PROCESS

d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction? (If any, please list them below).*

- THE LACK OF POSITIVE RESPONSE AT THE FARM LEVEL TO THE NEW RETIREMENT PROGRAM DUE TO THE FACT OF OFTEN CHANGES IN TAXATION AND RETIREMENT POLICIES IN LAST 10 YEARS

1. **Per capita consumption of beef in Canada (lb/capita)**

Year	lb/capita
1970	84.4
1971	88.6
1972	94.3
1973	92.7
1974	96.1
1975	106.4
1976	113.2
1977	107.7
1978	100.8
1979	88.0
1980	87.2
1981	89.7
1982	89.2
1983	88.2
1984	84.5



a. *Your prediction* - please state below the values YCU believe will prevail in the following years:

1990 = _____ lb/capita? 1995 = _____ lb/capita? 2000 = _____ lb/capita?

b. *How reliable do YOU consider YOUR prediction to be?*

····>·········>·······>···increasing reliability of estimate ···········>·······>······>

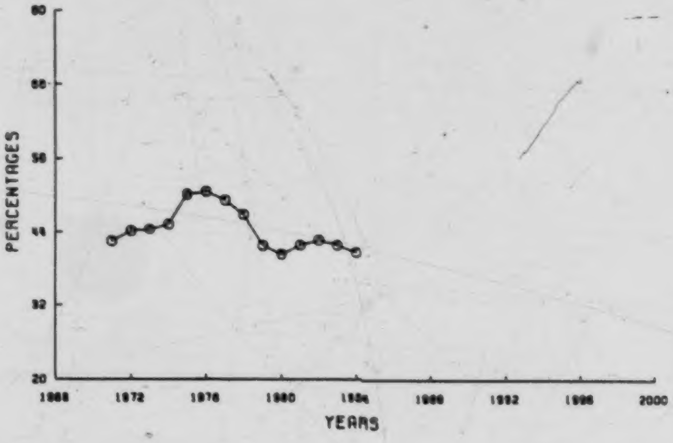
0 10 20 30 40 50 60 70 80 90 100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction?* (Please list them below).

d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction?* (If any, please list them below).

2. **Consumption of beef as a percentage of the total meat consumption (red meat and poultry excluding fish).**

Year	%
1971	42.5
1972	44.1
1973	44.4
1974	45.2
1975	50.1
1976	50.6
1977	49.2
1978	46.8
1979	41.8
1980	40.4
1981	41.9
1982	42.7
1983	41.9
1984	40.7



a. *Your prediction* - please state below the values YOU believe will prevail in the following years:

1990 = _____ %   1995 = _____ %   2000 = _____ %

b. *How reliable do YOU consider YOUR prediction to be?*

····>·········>·········>···increasing reliability of estimate ··········>·········>······>

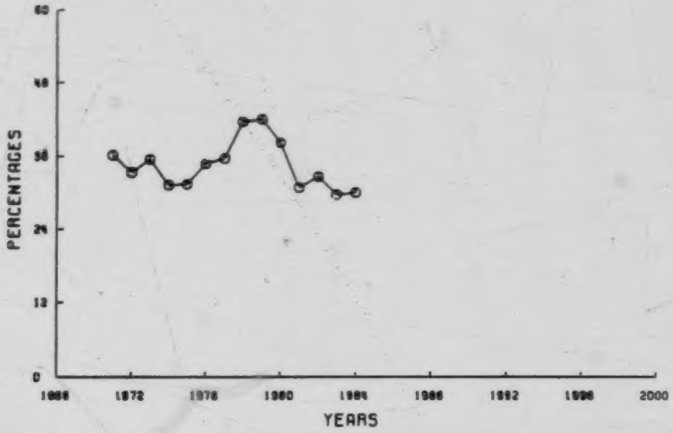
0 10 20 30 40 50 60 70 80 90 100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction?* (Please list them below).

d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction?* (If any, please list them below).

3. **Farm cash income from cattle and calves as a percentage of total farm incomes in Alberta.**

Year	%
1971	36.1
1972	33.2
1973	35.4
1974	31.1
1975	31.3
1976	34.6
1977	35.5
1978	41.4
1979	41.8
1980	38.0
1981	30.7
1982	32.4
1983	29.5
1984	29.8



a. *Your prediction* - please state below the values YOU believe will prevail in the following years:

1990 = _____ %   1995 = _____ %   2000 = _____ %

b. *How reliable do YOU consider YOUR prediction to be?*

····>·········>·······>···increasing reliability of estimate ··········>·······>·····>

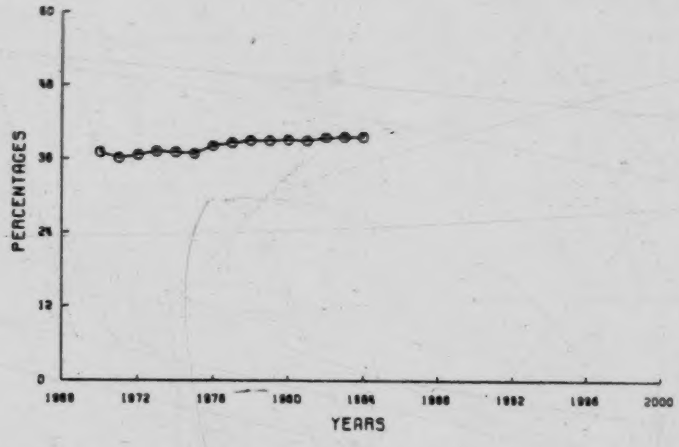
0 10 20 30 40 50 60 70 80 90 100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction?* (Please list them below).

d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction?* (If any, please list them below).

4. **The Alberta beef cow herd as a percentage of the Canadian beef cow herd.**

Year	%
1970	37.0
1971	36.1
1972	36.5
1973	37.1
1974	37.0
1975	36.8
1976	38.0
1977	38.5
1978	38.9
1979	38.9
1980	39.0
1981	38.9
1982	39.4
1983	39.5
1984	39.5



a. *Your prediction* - please state below the values YOU believe will prevail in the following years:

1990 = _____ %　　1995 = _____ %　　2000 = _____ %

b. *How reliable do YOU consider YOUR prediction to be?*

····>········>·······>···increasing reliability of estimate ··········>·······>·····>

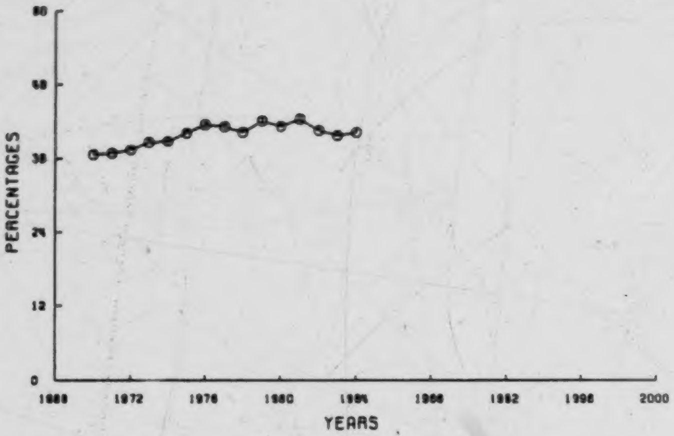
0　10　20　30　40　50　60　70　80　90　100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction?* (Please list them below).

d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction?* (If any, please list them below).

5. **The slaughter cattle marketed in Alberta as a percentage of the slaughter cattle marketed in Canada.**

Year	%
1970	36.5
1971	36.8
1972	37.3
1973	38.5
1974	38.7
1975	40.0
1976	41.5
1977	41.1
1978	40.2
1979	42.0
1980	41.1
1981	42.3
1982	40.4
1983	39.6
1984	40.0



a. *Your prediction* - please state below the values YOU believe will prevail in the following years:

1990 = _____ % 1995 = _____ % 2000 = _____ %

b. *How reliable do YOU consider YOUR prediction to be?*

····>·········>·········>···increasing reliability of estimate············>·········>·······>

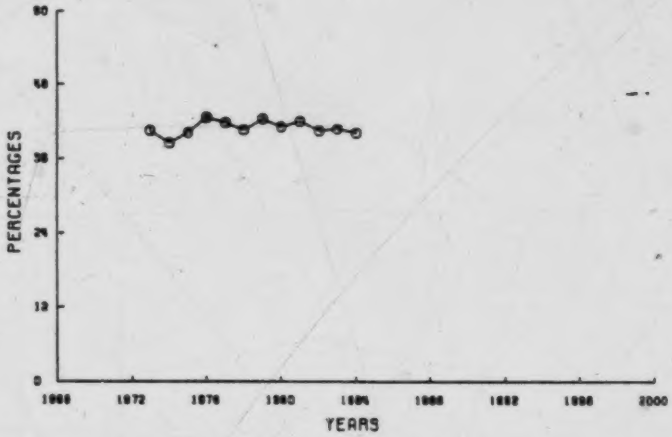
0 10 20 30 40 50 60 70 80 90 100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction?* (Please list them below).

d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction?* (If any, please list them below).

6. **The inspected domestic slaughter of cattle in Alberta as a percentage of inspected domestic slaughter of cattle in Canada.**

Year	%
1973	40.4
1974	38.5
1975	40.0
1976	42.5
1977	41.7
1978	40.5
1979	42.3
1980	41.0
1981	41.9
1982	40.4
1983	40.7
1984	40.1



a. *Your prediction* - please state below the values YOU believe will prevail in the following years:

1990 = _____ %   1995 = _____ %   2000 = _____ %

b. *How reliable do YOU consider YOUR prediction to be?*

····>·········>·········>···increasing reliability of estimate···········>·········>·······>

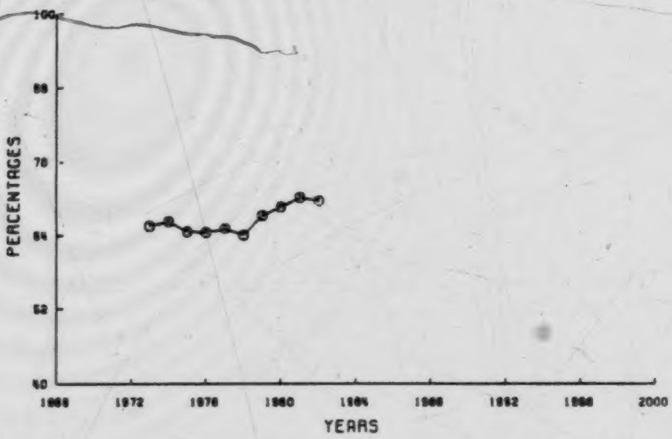
0 10 20 30 40 50 60 70 80 90 100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction?* (Please list them below).

d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction?* (If any, please list them below).

7. **Feedlot finished cattle* in the southern region (census divisions 1-6) as a percentage of the total feedlot finished cattle in Alberta.**
* The marketing of slaughter cattle of grade A has been applied as an approximation of feedlot volume.

Year	%
1973	65.5
1974	66.2
1975	64.6
1976	64.5
1977	65.1
1978	64.0
1979	67.2
1980	68.6
1981	70.1
1982	69.5
1983	not available
1984	not available



a. *Your prediction* - please state below the values YOU believe will prevail in the following years:

1985 = _____ %   1990 = _____ %   1995 = _____ %   2000 = _____ %

b. *How reliable do YOU consider YOUR prediction to be?*

····>·········>·······>···increasing reliability of estimate ··········>·········>·······>

0 10 20 30 40 50 60 70 80 90 100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction?* (Please list them below).

____

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d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction?* (If any, please list them below).

____

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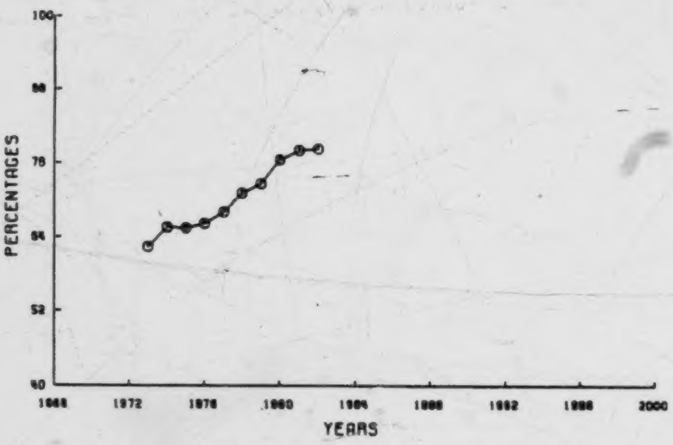
8. The inspected cattle slaughter in the southern region (census divisions 1-6) as a percentage of the Alberta inspected slaughter.

Year	%
1973	62.3
1974	65.5
1975	65.4
1976	66.1
1977	68.0
1978	71.0
1979	72.5
1980	76.4
1981	77.9
1982	78.2
1983	not available
1984	not available



a. *Your prediction* - please state below the values YOU believe will prevail in the following years:

1985 = _____ %   1990 = _____ %   1995 = _____ %   2000 = _____ %

b. *How reliable do YOU consider YOUR prediction to be?*

····>·········>·········>···increasing reliability of estimate············>·········>·······>

0 10 20 30 40 50 60 70 80 90 100

c. *What key developments (your assumptions) did YOU assume in making YOUR prediction?* (Please list them below).

d. *What other developments (your uncertainties), not considered above might result in major revisions in YOUR prediction?* (If any, please list them below).

PART B:

This part of Section I consists of a question concerned with possible **technological changes** at each level of the beef industry.

Please briefly outline technological changes which YOU anticipate within the next 10-15 years that in YOUR opinion will likely alter **the characteristics** of the beef industry.

1. **Producing Sector:**

2. **Processing Sector:**

3. **Retailing Sector:**

SECTION II: POLICY

This section is concerned with a consideration of possible corrective actions which future programs of government might undertake at each level of the beef industry in order to remedy the issue listed.

Please state issues and corrective actions that YOU believe should be considered in future programs/policies in the beef industry by policy makers.

1. **Producing Sector:**

ISSUE: CORRECTIVE ACTIONS:

2. **Processing Sector:**

ISSUE: CORRECTIVE ACTIONS:

3. **Retailing Sector:**

ISSUE: CORRECTIVE ACTIONS:

Appendix C

A Copy Of Round II Questionnaire

ALBERTA BEEF INDUSTRY TO 2000 - the second questionnaire

This questionnaire consists of two sections: Section I and Section II. The pretest showed that time required to complete this questionnaire is less than one hour.

Your comments on any question, statement, or interpretation are welcome; if more space is needed, please use a reverse side of a page.

SECTION I
PART A

In this part of Section I you are asked to evaluate the **assumptions/statements** underlying the experts' predictions in the first questionnaire through the use of **"importance"** and **"validity"** scales. Assumptions/statements are divided into three major groups.

a. Technological changes
b. International considerations
c. General assumptions/statements

These items are a summary of the ideas generated in the previous round.

INSTRUCTIONS:

a. Please read each item carefully and assign **the importance score** (importance as a factor in making the forecasts contained in this study; 1-low through to 5-high) and **the validity score** (likelihood of occurrence; 1-low through to 5-high) to each assumption/statement by using the importance and validity scales accordingly.

b. If items are listed as causes of a general heading under which they are grouped, you are asked to evaluate the general statement (heading) for its **validity** and **importance** and to indicate if you **agree** or **disagree** with each cause.

ATTENTION:

The description of each score in each scale is presented in the enclosed scales booklet.

IMPORTANCE				VALIDITY
1 v. unimportant 2 unimportant 3 indeterminable 4 important 5 v. important				1 v. unreliable 2 unreliable 3 indeterminable 4 reliable 5 v. reliable
	TECHNOLOGICAL CHANGES **Producing sector**			
1 2 3 4 5	a. Increase in reproductive efficiency (Please indicate by check mark if you agree or disagree with the factor of change stated below).			1 2 3 4 5
		Agree	Disagree	
	- improved management techniques			
	- twinning			
1 2 3 4 5	b. Improved feeding efficiency (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1 2 3 4 5
		Agree	Disagree	
	- improvement of genetic characteristics			
	- improved feeds and feeding formulas			
	- increased use of micronutrients			
	- broader use of implant type growth stimulants, hormones and/or neutralizers of growth inhibitors			
1 2 3 4 5	c. Improved health protection (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1 2 3 4 5
		Agree	Disagree	
	- prevention of shipping diseases (e.g. shipping fever, pneumonia)			
	- further development of vaccine treatment of cattle diseases			
	- control of livestock pests			
	- improved health management techniques			
1 2 3 4 5	d. Increased use of forage in feeding (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1 2 3 4 5
		Agree	Disagree	
	- development of new more productive and/or higher nutritional quality varieties			
	- increased area under irrigation			
	- new methods of harvesting and preserving forage quality			
	- increased use of crop rotations (including forage)			
	- improved range and pasture management practises			
	- reduction in losses due to bloat			
1 2 3 4 5	e. Optimization of lean cattle production (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1 2 3 4 5
		Agree	Disagree	
	- cross breeding			
	- feeding and slaughtering of bulls			
	Other technological changes at producing sector			
1 2 3 4 5	f. Increased use of residuals of crop production (e.g. straw)			1 2 3 4 5
1 2 3 4 5	g. More backgrounding			1 2 3 4 5
1 2 3 4 5	h. Increased weaning weights			1 2 3 4 5
1 2 3 4 5	i. More attention to individual animals performance			1 2 3 4 5
1 2 3 4 5	j. Increasing size of the average feedlot in order to capture benefits of economies of scale			1 2 3 4 5

IMPORTANCE				VALIDITY
v. unimportant 1 unimportant 2 indeterminable 3 important 4 v. important 5				v. unreliable 1 unreliable 2 indeterminable 3 reliable 4 v. reliable 5
1 2 3 4 5	k. Trend to large feedlots with central slaughtering facilities			1 2 3 4 5
1 2 3 4 5	l. A return to conventional breeds			1 2 3 4 5
1 2 3 4 5	m. Increase in range-fed cattle			1 2 3 4 5
1 2 3 4 5	n. The establishment of "futures" market for beef cattle			1 2 3 4 5
1 2 3 4 5	o. Diversification of agriculture by implementing new crops in order to maximize resource use and reduce income fluctuation risk			1 2 3 4 5
1 2 3 4 5	p. Survivors will have more equity and less debt			1 2 3 4 5
1 2 3 4 5	q. Computer programs which enable cost analysis of feeding cattle			1 2 3 4 5
	Processing and retailing sector			
1 2 3 4 5	a. Further rationalization of packing plants will take place (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1 2 3 4 5
		Agree	Disagree	
	- mechanization of unloading and loading of beef carcasses	____	____	
	- laser cutting of beef cuts	____	____	
	- automated processing with possibility of use of robotics	____	____	
	- increasing plant size	____	____	
	- trend to locate plants in rural areas	____	____	
	- trend to large multipurpose slaughtering facilities	____	____	
	- development of a use for paunch residue	____	____	
	- development of a system to extract major portion of organic matter from waste water	____	____	
	- lowering of stress impact on beasts to be slaughtered	____	____	
	- universal plant identification systems for live cattle to link up grade information with farm of origin	____	____	
1 2 3 4 5	b. Development of an objective method for determining carcass value (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1 2 3 4 5
		Agree	Disagree	
	- electronic grading	____	____	
	- changes in grading system leading to fuller description of carcass	____	____	
	- new methods of measuring tenderness	____	____	
1 2 3 4 5	c. Changes in processing techniques (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1 2 3 4 5
		Agree	Disagree	
	- more fat trimmed at processing level	____	____	
	- increase in centralized cutting	____	____	
	- aging primal and subprimal cuts in vacuum packages	____	____	
	- new tenderization techniques (e.g. mechanical blade, electric shocking)	____	____	
	- increased use of restructured products	____	____	
	- resolving the problem of maintaining attractive colors of meat	____	____	
	- increase in frozen beef products (improvement of technology of keeping fresh appearance)	____	____	
	- extensive deboning of beef products (more muscle cutting)	____	____	
	- elimination of dark cutter	____	____	

IMPORTANCE								VALIDITY				
v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5				v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
1	2	3	4	5	d. Changes in product design and packaging (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1	2	3	4	5
						Agree	Disagree					
					- small servings	____	____					
					- convenience: "easy to prepare", "ready to eat"	____	____					
					- extended shelf-life (e.g. vacuum packaging)	____	____					
					- a "healthier" leaner product	____	____					
					- improved appearance and consumer appeal	____	____					
					- increased marketing of premium and low grade cuts, less availability of intermediate cuts	____	____					
					- increase in specialty meats and in variety of products	____	____					
					- more uniformity (taking less shelf space)	____	____					
					- name branding of beef products	____	____					
					- labeling of beef products with nutritional information and cooking ideas	____	____					
1	2	3	4	5	e. Electronic scanning will be used widely (Please indicate by check mark if you agree or disagree with the factor of change stated below)			1	2	3	4	5
						Agree	Disagree					
					- to measure actual yield and efficiency	____	____					
					- to identify marketing patterns, shrinks	____	____					
					Other technological changes at retailing sector							
1	2	3	4	5	f. Blending meats from different species into specialty hamburgers			1	2	3	4	5
1	2	3	4	5	g. Possible purchase of meat directly from home by computer			1	2	3	4	5
1	2	3	4	5	h. More active role in custom feeding of cattle. The retail sector will likely be involved from feedlot operation to consumer; thereby affecting more control on pricing and profitability			1	2	3	4	5

IMPORTANCE						VALIDITY				
v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5		v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
					INTERNATIONAL CONSIDERATIONS					
1	2	3	4	5	a. No large scale importations of cheap meat beyond todays level	1	2	3	4	5
1	2	3	4	5	b. Loss of access to U.S. market, particularly Pacific North-West	1	2	3	4	5
					Development of new and/or expansion of already established export markets in:					
1	2	3	4	5	c. U.S.A.	1	2	3	4	5
1	2	3	4	5	d. Pacific Rim Countries	1	2	3	4	5
1	2	3	4	5	e. Further increase in the quantity of beef from Western Canada sold in Pacific North-West of USA	1	2	3	4	5
					Agree Disagree					
					- transportation cost relation between West-East and North-South ____ ____					
					- reduced ground water in Texas and other adjacent states resulting in a shift of U.S. feedlots back to Mid-West ____ ____					
					Restrictions in the trade of:					
1	2	3	4	5	f. Beef between provinces	1	2	3	4	5
1	2	3	4	5	g. Cattle between provinces	1	2	3	4	5
1	2	3	4	5	h. Beef between Canada and USA	1	2	3	4	5
1	2	3	4	5	i. Cattle between Canada and USA	1	2	3	4	5
					Other International Considerations:					
1	2	3	4	5	j. Free trade with USA becomes a fact by the year 2000	1	2	3	4	5
1	2	3	4	5	k. The world surplus of wheat will continue	1	2	3	4	5
1	2	3	4	5	l. The world surplus of vegetable oils will continue	1	2	3	4	5
1	2	3	4	5	m. Increased prices of vegetables protein as a result of lack of water in major growing areas of USA	1	2	3	4	5

IMPORTANCE						VALIDITY				
v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5	GENERAL ASSUMPTIONS/STATEMENTS	v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
					Economic outlook					
1	2	3	4	5	a. The Canadian economy will not improve by the year 2000 resulting in decrease of disposable income	1	2	3	4	5
1	2	3	4	5	b. An upswing in the Canadian economy will take place in the 90's	1	2	3	4	5
1	2	3	4	5	c. Higher interest rates will prevail by the year 2000	1	2	3	4	5
1	2	3	4	5	d. Difficulties with obtaining new credits will continue	1	2	3	4	5
1	2	3	4	5	e. Alberta population will remain unchanged	1	2	3	4	5
1	2	3	4	5	f. Canadian population is aging	1	2	3	4	5
1	2	3	4	5	g. Increased prices of agricultural machinery will favor beef production	1	2	3	4	5
1	2	3	4	5	h. The beef industry is a mature industry	1	2	3	4	5
					Production					
1	2	3	4	5	a. The herd rebuilding phase of the cattle cycle will take place by the end of the 90's	1	2	3	4	5
					The optimism of rebuilding phase of cycle will be:					
1	2	3	4	5	b. Dampened by limitations in price imposed by competitive meats whose price cycles are not in phase with beef	1	2	3	4	5
1	2	3	4	5	c. Enhanced by prospect of lower grain prices	1	2	3	4	5
1	2	3	4	5	d. Increased competitiveness of beef will occur (Please indicate by check mark if you agree or disagree with the factor of change stated below)	1	2	3	4	5
					Agree Disagree					
					- increased consumer consciousness regarding drug and chemical residues in consumer meat (especially poultry and pork) ____ ____					
					- animal rights people will succeed in limiting or banning the intensive production of meat, especially poultry and hogs ____ ____					
					- acceptance of yellow fat by consumers ____ ____					
					- more improvement potential for beef than for other meats which have already made use of most new technology available to them ____ ____					
					The place left by less efficient producers will be:					
1	2	3	4	5	e. Taken up by new entrants	1	2	3	4	5
1	2	3	4	5	f. Not taken up by more efficient producers since cow/calf operation is land based	1	2	3	4	5
					Other general assumptions/statements					
1	2	3	4	5	g. Cattle cycle no longer exists due to world supply of beef	1	2	3	4	5
1	2	3	4	5	h. The number of calves produced will not decline further because it is determined by availability of marginal land and residual feeds	1	2	3	4	5
1	2	3	4	5	i. The reduction of cow herd, to the point that feedlot and processing sectors will be forced out of business, will occur	1	2	3	4	5

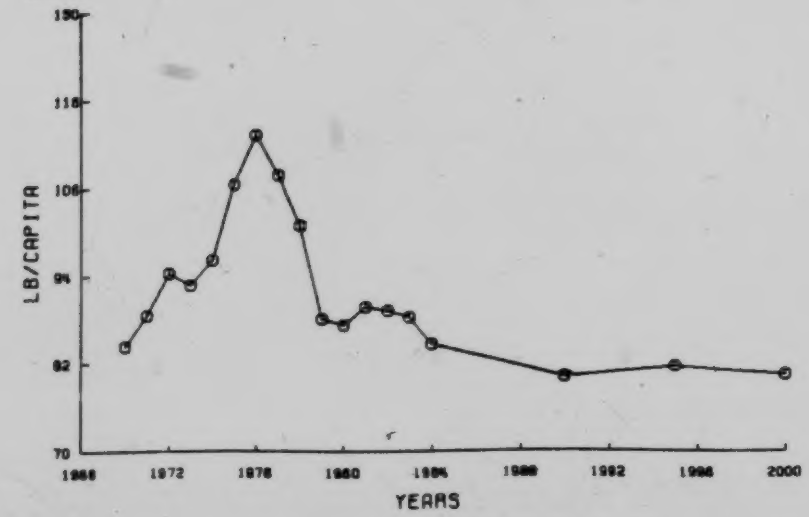
IMPORTANCE						VALIDITY				
v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5		v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
1	2	3	4	5	j. Rising inputs, processing and retailing costs will squeeze out producers with lower efficiency	1	2	3	4	5
1	2	3	4	5	k. Prevailing lower feed grain prices will have a greater impact on lowering costs of production for poultry and pork than for beef	1	2	3	4	5
1	2	3	4	5	l. Break out of disease (e.g. Food and Mouth) may occur in Canada	1	2	3	4	5
1	2	3	4	5	m. Major drought or extended period of dry weather will occur by the year 2000	1	2	3	4	5
1	2	3	4	5	n. New lands being opened are better suited for forage production	1	2	3	4	5
1	2	3	4	5	o. Recreational pressure on some good land will be more than offset by shift of marginal land from cash crop production to beef production	1	2	3	4	5
					Government involvement					
1	2	3	4	5	a. Rationalization of crow benefit issue (benefits paid to producer) or continuation of Alberta feed grain policy	1	2	3	4	5
1	2	3	4	5	b. Continued role of government interfering with true market signals and causing distortions to production decisions	1	2	3	4	5
1	2	3	4	5	c. Provincial government assistance on a consistent basis in order to manage cattle production as a enterprise producing more economic activity	1	2	3	4	5
1	2	3	4	5	d. Rationalization of government support programs across provinces leading to uniform approach	1	2	3	4	5
1	2	3	4	5	e. Government policies to reduce large swings in beef prices so that people become accustomed to a price	1	2	3	4	5
					Marketing and promotion					
1	2	3	4	5	a. More aggressive and more innovative advertising and promotion of beef products will take place	1	2	3	4	5
1	2	3	4	5	b. Research and industry effort will alleviate many health concerns	1	2	3	4	5
1	2	3	4	5	c. Beef will lose its attraction as a loss leader in retailing	1	2	3	4	5
					A supply management marketing board will be:					
1	2	3	4	5	d. Established for cattle production	1	2	3	4	5
1	2	3	4	5	e. Established for pork production	1	2	3	4	5
1	2	3	4	5	f. Continued for poultry	1	2	3	4	5
					Consumers' preferences					
1	2	3	4	5	a. Trend to smaller servings, lower calorie intake	1	2	3	4	5
1	2	3	4	5	b. Consumer preferences will continue changing toward light and convenient foods	1	2	3	4	5
1	2	3	4	5	c. Consumption of meat has plateaued at a level of around 200 lbs per capita and will remain similar until the year 2000	1	2	3	4	5
1	2	3	4	5	d. Consumption of poultry has reached its peak	1	2	3	4	5

PART B

In this part of Section I you are asked to evaluate specific assumptions/statements concerned with each subgroup of questions (see below) for their importance (importance as a factor in making the forecasts in this study) and validity (likelihood of occurrence) and as well to indicate your current preditions of future changes in items of interest contained in eight questions from the first questionnaire.

IMPORTANCE		VALIDITY
v. unimportant 1 unimportant 2 indeterminable 3 important 4 v. important 5	**a. SPECIFIC ASSUMPTIONS/STATEMENTS TO QUESTIONS 1 AND 2 (with respect to changes in absolute and relative consumption of beef)** **Please read each item carefully and assign an importance and validity score to each assumption/statement by using the importance and validity scales accordingly**	v. unreliable 1 unreliable 2 indeterminable 3 reliable 4 v. reliable 5
	Assumptions/statements favoring the increase of beef consumption (in absolute and/or relative terms)	
1 2 3 4 5	a. Consumers will realize that beef is a source of comparatively low cost "valuable nutrients"	1 2 3 4 5
1 2 3 4 5	b. Beef will continue to be a preferred meat due to its flavor	1 2 3 4 5
1 2 3 4 5	c. Adverse publicity toward other food items	1 2 3 4 5
1 2 3 4 5	d. Beef hamburgers will continue to be the main form of meat consumption	1 2 3 4 5
	Assumptions/statements leading to the decrease of beef consumption (in relative and/or absolute terms)	
1 2 3 4 5	a. White meat and pork processing innovations will continue at a faster pace (greater penetration of available market)	1 2 3 4 5
1 2 3 4 5	b. Increase in competition from other protein sources (e.g. vegetables)	1 2 3 4 5
1 2 3 4 5	c. Increasing popularity of poultry in fast food outlets	1 2 3 4 5
	Assumptions/statements of a neutral nature or uncertain influence on consumption of beef (in absolute and relative terms)	
1 2 3 4 5	a. Increased demand for white veal	1 2 3 4 5
1 2 3 4 5	b. The consumption of beef is more affected by changes in disposable income than other meats	1 2 3 4 5
1 2 3 4 5	c. Per capita consumption will continue to be determined by herd production which tends to go in 10 year cycles modified by product price, price of competitive products and cost of inputs	1 2 3 4 5
1 2 3 4 5	d. Lack of cooperation in order to change selling techniques at retail store level (both in percent of profit and changing style of cuts)	1 2 3 4 5

Q. 1. Per capita consumption of beef in Canada (lb/capita)



a. Please examine the historical data and preliminary predictions in the graph above and summary statistics in columns A, B, and C of the table below. Finally, state your current prediction based upon all of the preceding related information.

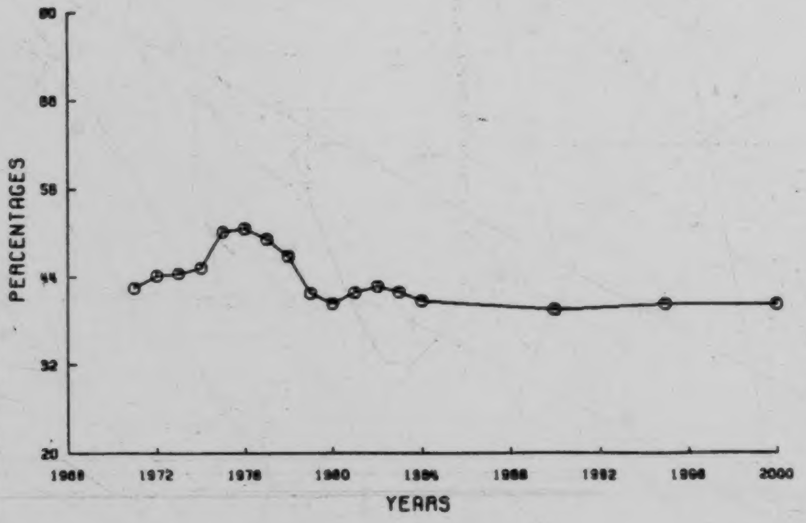
	RESPONDENT PREDICTIONS			
TIME PERIOD	LOW (A)	HIGH (B)	AVERAGE (C)	YOUR CURRENT ESTIMATES (D)
1990	70	88	80.0	______
1995	70	96	81.5	______
2000	65	100	80.4	______

b. If your predictions differ from the average values please state the reasons below.

____

____

Q. 2. Consumption of beef as a percentage of the total meat consumption (red meat and poultry excluding fish)



a. Please examine the historical data and preliminary predictions in the graph above and summary statistics in columns A, B, and C of the table below. Finally, **state your current prediction** based upon all of the preceding related information.

	RESPONDENT PREDICTIONS			YOUR CURRENT ESTIMATES
TIME PERIOD	LOW (A)	HIGH (B)	AVERAGE (C)	(D)
1990	35	45	39.5	____________
1995	32	50	40.2	____________
2000	29	55	40.2	____________

b. If your predictions differ from the average values please state the reasons below.

____

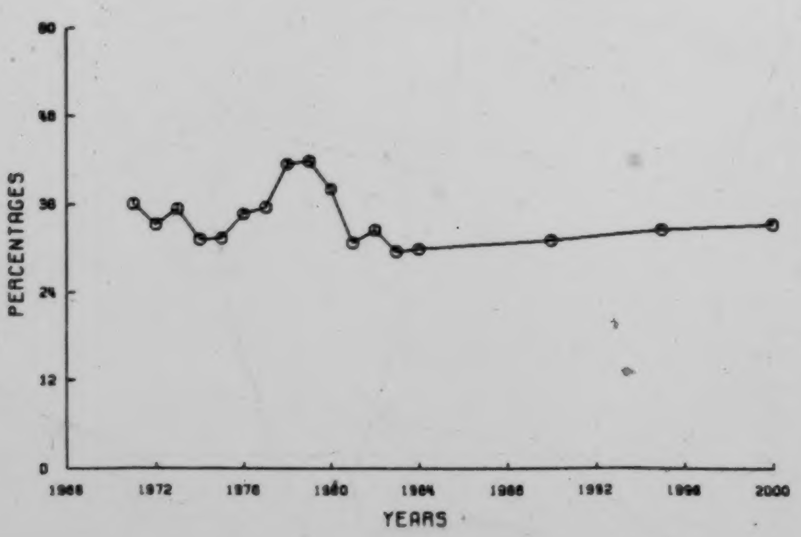
____

b. SPECIFIC ASSUMPTIONS/STATEMENTS TO QUESTIONS 3, 4, 5 AND 6 (with respect to changes in relative farm cash income generated by beef and relative changes in beef cow herd, slaughter cattle marketings, and inspected domestic slaughter in Alberta versus Canada)

Please read each item carefully and assign an importance and validity score to each assumption/statement by using the importance and validity scales accordingly.

IMPORTANCE						VALIDITY				
v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5		v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
					Assumptions/statements favoring the expansion of one or more items of interest					
1	2	3	4	5	a. Alberta will continue to have natural comparative advantage (land, climate, capital, and expertise)	1	2	3	4	5
1	2	3	4	5	b. Dairy-beef cow numbers will decline more in east as dairy products build up	1	2	3	4	5
1	2	3	4	5	c. The gap between transportation rates of live cattle and dressed beef will widen	1	2	3	4	5
1	2	3	4	5	d. Increased demand for Alberta feeders from other provinces and USA	1	2	3	4	5
					Assumptions/statements not favoring the expansion of one or more items of interest					
1	2	3	4	5	a. Increased numbers of cattle slaughter shipped across the U.S. border due to the failure of Alberta plants to meet low cost of operation of US plants (higher efficiency and/or lower labor costs)	1	2	3	4	5
1	2	3	4	5	b. US processors establishing new plants close to the border to draw finished animals to USA	1	2	3	4	5
1	2	3	4	5	c. Overcapacity and low margins do not favor new plants in Alberta	1	2	3	4	5
1	2	3	4	5	d. One plant in North-Central region of Alberta will close without offsetting increase in capacity by existing plants or by new plant	1	2	3	4	5
					Assumptions/statements of a neutral nature or uncertain influence on one or more items of interest					
1	2	3	4	5	a. The Montreal market remains the major market for Alberta beef	1	2	3	4	5
1	2	3	4	5	b. Saskatchewan has the ability to increase significantly its role in national beef industry thereby decreasing Alberta's share; however this is not likely to occur	1	2	3	4	5
1	2	3	4	5	c. Ontario, Quebec, Manitoba have more production options for their available land base and can obtain better payback from subsidization of operations other than beef	1	2	3	4	5
1	2	3	4	5	d. During herd rebuilding stage the cow herd numbers will shift to Saskatchewan and Alberta and build around mixed grain/beef cow economy	1	2	3	4	5
1	2	3	4	5	e. Alberta has appropriate facilities and therefore everything that is produced will be fed and slaughtered in Alberta in order to avoid unnecessary costs	1	2	3	4	5
1	2	3	4	5	f. No significant change in the meat aging process and continuation of using transit time and transport resources as aging facilities	1	2	3	4	5

Q. 3. Farm cash income from cattle and calves as a percentage of total farm incomes in Alberta

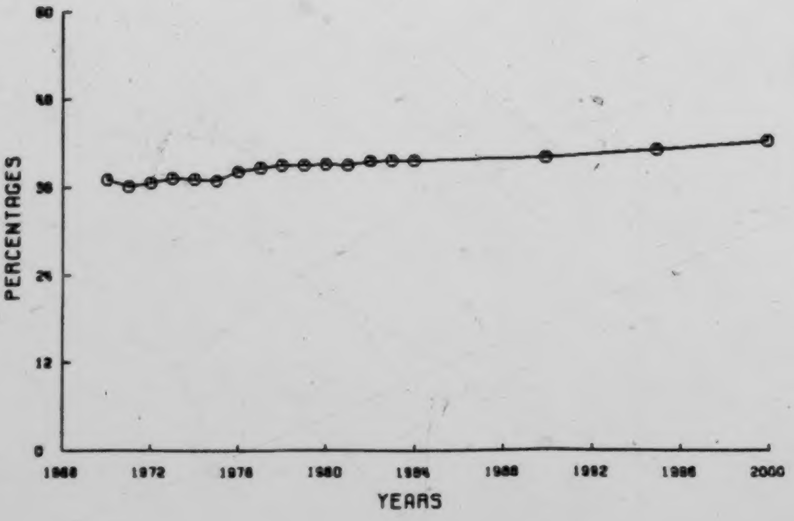


a. Please examine the historical data and preliminary predictions in the graph above and summary statistics in columns A, B, and C of the table below. Finally, **state your current prediction** based upon all of the preceding related information.

	RESPONDENT PREDICTIONS			YOUR CURRENT ESTIMATES
TIME PERIOD	LOW (A)	HIGH (B)	AVERAGE (C)	(D)
1990	27	40	31.0	
1995	25	42	32.5	
2000	25	50	33.2	

b. **If your predictions differ from the average values please state the reasons below.**

Q. 4. The Alberta beef cow herd as a percentage of the Canadian beef cow herd

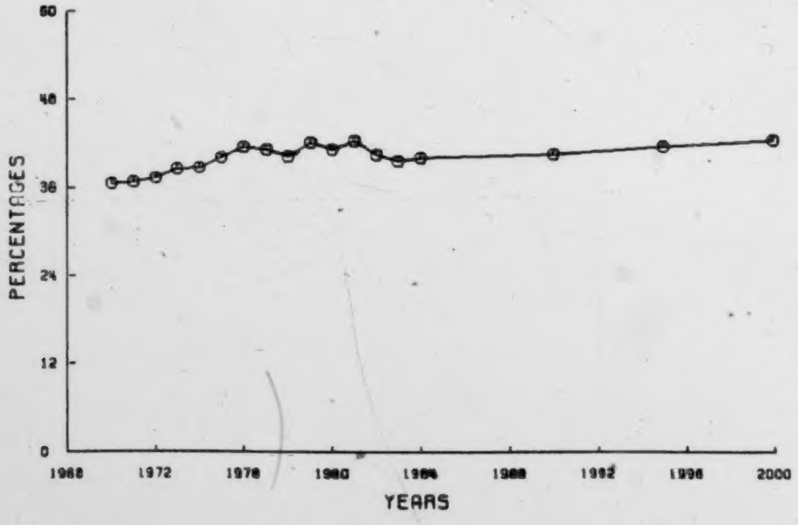


a. **Please examine the historical data and preliminary predictions in the graph above and summary statistics in columns A, B, and C of the table below. Finally, state your current prediction based upon all of the preceding related information.**

	RESPONDENT PREDICTIONS			
TIME PERIOD	LOW (A)	HIGH (B)	AVERAGE (C)	YOUR CURRENT ESTIMATES (D)
1990	37	42	39.8	
1995	37	45	40.9	
2000	37.5	50	42.0	

b. **If your predictions differ from the average values please state the reasons below.**

Q. 5. **The slaughter cattle marketed in Alberta as a percentage of the slaughter cattle marketed in Canada**



a. **Please examine the historical data and preliminary predictions in the graph above and summary statistics in columns A, B, and C of the table below. Finally, state your current prediction based upon all of the preceding related information.**

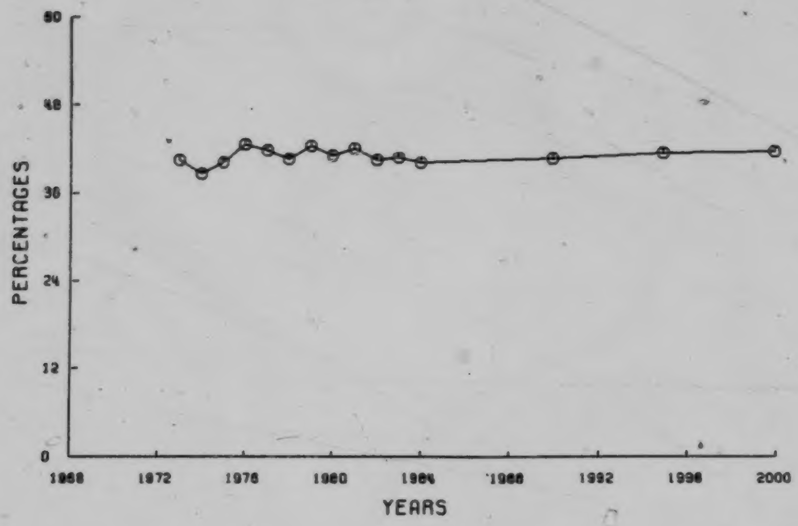
	RESPONDENT PREDICTIONS			YOUR CURRENT ESTIMATES
TIME PERIOD	LOW (A)	HIGH (B)	AVERAGE (C)	(D)
1990	36	45	40.6	______
1995	38	50	41.8	______
2000	36	60	42.6	______

b. **If your predictions differ from the average values please state the reasons below.**

____

____

Q. 6. The inspected domestic slaughter of cattle in Alberta as a percentage of inspected domestic slaughter of cattle in Canada



a. **Please examine the historical data and preliminary predictions in the graph above and summary statistics in columns A, B, and C of the table below. Finally, state your current prediction based upon all of the preceding related information.**

TIME PERIOD	RESPONDENT PREDICTIONS LOW (A)	HIGH (B)	AVERAGE (C)	YOUR CURRENT ESTIMATES (D)
1990	36	44	40.6	______________
1995	36	46	41.3	______________
2000	36	46	41.6	______________

b. **If your predictions differ from the average values please state the reasons below.**

____

____

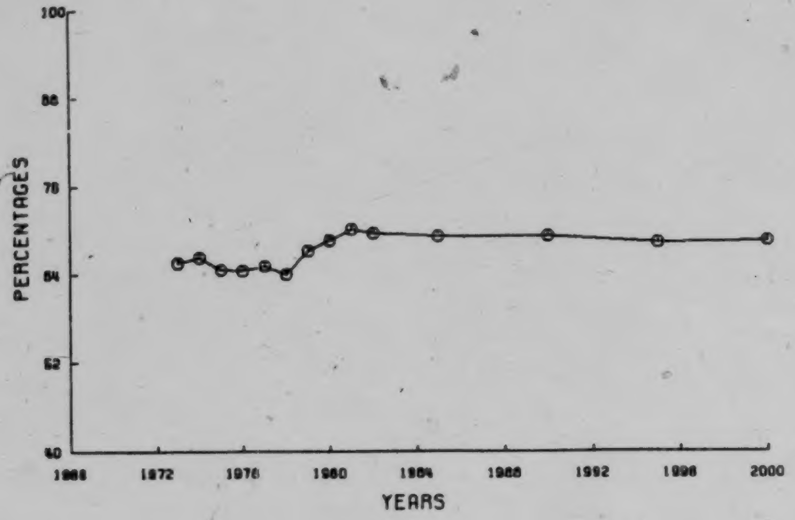
c. SPECIFIC ASSUMPTIONS/STATEMENTS TO QUESTIONS 7 AND 8 (with respect to relative changes in feedlot finished cattle and inspected cattle slaughter in Southern Alberta, census divisions 1-6, versus North-Central Alberta, remaining census divisions)

Please read each item carefully and assign an importance and validity score to each assumption/statement by using the importance and validity scales accordingly.

IMPORTANCE v. unimportant	unimportant	indeterminable	important	v. important		VALIDITY v. unreliable	unreliable	indeterminable	reliable	v. reliable
1	2	3	4	5		1	2	3	4	5
					Assumption/statements favoring the expansion of items of interest The further concentration of feedlot industry in Southern Alberta will take place due to:					
1	2	3	4	5	a. The lowest cost of production (larger units with high level of expertise)	1	2	3	4	5
1	2	3	4	5	b. Overcapacity of facilities	1	2	3	4	5
1	2	3	4	5	c. Closeness to alternate markets	1	2	3	4	5
1	2	3	4	5	d. Producers in South being risk takers (a necessary attitude in feedlot business)	1	2	3	4	5
1	2	3	4	5	e. More moderate winter climate	1	2	3	4	5
1	2	3	4	5	g. More assurance of feed in irrigation areas and that irrigation will continue as subsidy to feed production	1	2	3	4	5
1	2	3	4	5	h. Higher protein feeds	1	2	3	4	5
1	2	3	4	5	i. Reduction of cattle number in Peace River area	1	2	3	4	5
					The further concentration of processing industry in Southern Alberta will take place due to:					
1	2	3	4	5	a. Plants in South continuing to modernize more on average than other plants in Alberta	1	2	3	4	5
1	2	3	4	5	b. Supply of cattle with higher dressing percentage	1	2	3	4	5
1	2	3	4	5	c. Closeness to alternate markets	1	2	3	4	5
1	2	3	4	5	d. The feeder cattle backgrounded in the North-Central region being shipped to Southern region for feedlot finishing	1	2	3	4	5
					The assumptions not favoring the expansion of feeding and/or processing industry in Southern Alberta The following factors will result in the decrease of feedlot and packing (processing) industry concentration in Southern Alberta:					
1	2	3	4	5	a. Small feedlots of 1000-2000 head capacity are starting to develop in North-Central region. This size of feedlot will be competitive with large feedlots in South, both in production and marketing costs	1	2	3	4	5
1	2	3	4	5	b. North-Central region is better suited to grow forage what will lead to backgrounding feeder cattle	1	2	3	4	5
1	2	3	4	5	c. Higher price differential on grain between both regions	1	2	3	4	5
1	2	3	4	5	d. Increasing transportation costs	1	2	3	4	5
1	2	3	4	5	e. Availability of feeder cattle in North-Central region will continue and even increase	1	2	3	4	5
1	2	3	4	5	f. Higher cost of irrigation in South will force irrigated land into higher returning cash crops rather than feed	1	2	3	4	5
1	2	3	4	5	g. Good supply of finished cattle will establish bases for slaughter facility in North-Central region	1	2	3	4	5
1	2	3	4	5	h. Government attempts through programs and regulation to spread out the industry	1	2	3	4	5

Q. 7. **Feedlot finished cattle* in southern region (census divisions 1-6) as a percentage of the total feedlot finished cattle in Alberta.**

*** The marketing of slaughter cattle of grade A has been applied as an approximation of feedlot volume.**



a. Please examine the historical data and preliminary predictions in the graph above and summary statistics in columns A, B, and C of the table below. Finally, state your current prediction based upon all of the preceding related information.

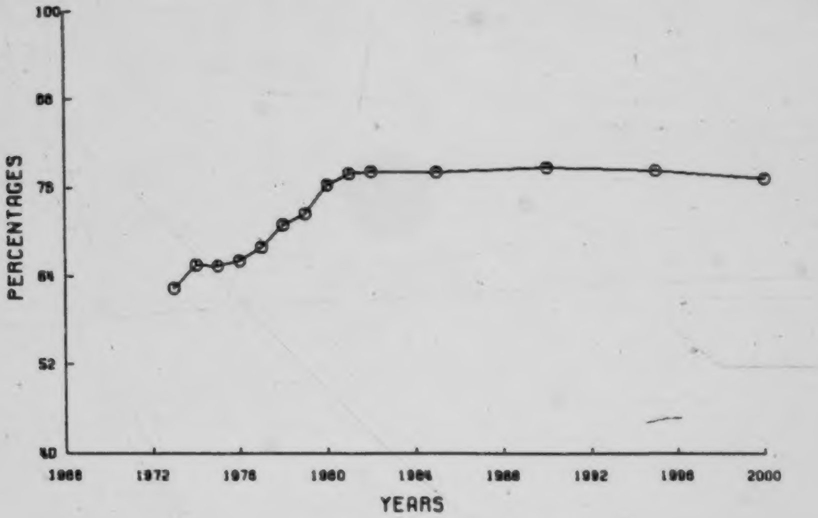
TIME PERIOD	RESPONDENT PREDICTIONS LOW (A)	HIGH (B)	AVERAGE (C)	YOUR CURRENT ESTIMATES (D)
1985	65	72	69.2	__________
1990	60	76	69.2	__________
1995	40	80	68.2	__________
2000	40	82	68.5	__________

b. **IF your predictions differ from the average values please state the reasons below.**

____

____

Q. 8. The inspected cattle slaughter in the southern region (census divisions 1-6) as a percentage of the Alberta inspected slaughter



a. Please examine the historical data and preliminary predictions in the graph above and summary statistics in columns A, B, and C of the table below. Finally, **state your current prediction** based upon all of the preceding related information.

	RESPONDENT PREDICTIONS			YOUR CURRENT ESTIMATES
TIME PERIOD	LOW (A)	HIGH (B)	AVERAGE (C)	(D)
1985	70	80.5	78.2	
1990	70	90.0	78.8	
1995	60	95	78.4	
2000	50	95	77.4	

b. If your predictions differ from the average values please state the reasons below.

SECTION II

This section deals with the evaluation of programs proposed by the panel as being required in the beef industry.

Please read each item carefully and next assign the desirability (the degree to which something should be done; 1-low through to 5-high) **and feasibility** (the degree to which something can be done; 1-low through to 5-high) **score to it.**

ATTENTION:

The description of each score in each scale is presented in the scales booklet. Please familiarize yourself well with descriptions of feasibility and desirability score before you proceed with your evaluation.

DESIRABILITY						FEASIBILITY				
v. undesirable 1	undesirable 2	indeterminable 3	desirable 4	v. desirable 5		v. infeasible 1	infeasible 2	indeterminable 3	feasible 4	v. feasible 5
					Regarding government programs at producer level:					
1	2	3	4	5	a. Correct the distortions created by programs already implemented	1	2	3	4	5
1	2	3	4	5	b. Do not implement new programs leading to distortion of marketing signals	1	2	3	4	5
1	2	3	4	5	c. Increase infrastructure development	1	2	3	4	5
1	2	3	4	5	d. Promote an uniform stabilization program	1	2	3	4	5
1	2	3	4	5	e. If idea of uniform approach will not succeed implement programs challenging those of other provinces	1	2	3	4	5
1	2	3	4	5	f. Ensure that Western Grain Transportation subsidies will be paid to producers	1	2	3	4	5
1	2	3	4	5	g. If method of payment is not solved continue feed grain market adjustment program	1	2	3	4	5
1	2	3	4	5	h. Discontinue or reform policies leading to cropping of marginal land	1	2	3	4	5
1	2	3	4	5	i. Stop excessive loss insurance programs which are in reality subsidy programs	1	2	3	4	5
1	2	3	4	5	j. Develop program supporting the conservation of land resources	1	2	3	4	5
1	2	3	4	5	k. Subsidize production in order to ensure utilization of existing processing capacity in Alberta	1	2	3	4	5
1	2	3	4	5	l. Allow for asset transfer from financially troubled producer; do not support moratoriums and debt write downs	1	2	3	4	5
					Tax policies:					
1	2	3	4	5	m. In and out producers should be excluded from benefits such as tax write offs, subsidy, etc.	1	2	3	4	5
1	2	3	4	5	n. Instead of price supports reduce taxes in inputs	1	2	3	4	5
1	2	3	4	5	o. Create an income stabilization trust provision in the tax law, which farmers can use at their option	1	2	3	4	5

DESIRABILITY						FEASIBILITY				
v. undesirable	undesirable	indeterminable	desirable	v. desirable		v. infeasible	infeasible	indeterminable	feasible	v. feasible
1	2	3	4	5		1	2	3	4	5
					Regarding government programs at processing level:					
1	2	3	4	5	a. Provide establishment and capitalization support	1	2	3	4	5
1	2	3	4	5	b. Provide tax subsidies for modernization of plants	1	2	3	4	5
1	2	3	4	5	c. Allow obsolete plants to close	1	2	3	4	5
1	2	3	4	5	d. Do not allow new processing plants into the market when overcapacity exists	1	2	3	4	5
1	2	3	4	5	e. Ensure competitive atmosphere among plants	1	2	3	4	5
1	2	3	4	5	f. Introduce "open shop" legislation in order that employees have choice as to whether to belong to the union or not	1	2	3	4	5
1	2	3	4	5	g. Allow plants to buy their own coverage of workmen's compensation	1	2	3	4	5
1	2	3	4	5	h. Allow plants designated only for export production to meet only importer's standards	1	2	3	4	5
1	2	3	4	5	i. Ensure more effective use of existing inspectors and veterinary personnel in order to build up consumer confidence in quality of beef products	1	2	3	4	5
1	2	3	4	5	j. Improve price discovery between processors and retailers	1	2	3	4	5
					Grading system:					
1	2	3	4	5	k. Base payment on edible red meat content	1	2	3	4	5
1	2	3	4	5	l. Remove discounts on carcasses over 800 lbs in order to ensure more efficient processing	1	2	3	4	5
1	2	3	4	5	m. Supplement grading system by having export market grades meeting requirements of major importers	1	2	3	4	5
1	2	3	4	5	n. Reduce the cost recovery from grading since the quality assurance is also a benefit to consumer	1	2	3	4	5
					Regarding government programs at retailing level:					
1	2	3	4	5	a. Encourage new marketing strategies for beef products	1	2	3	4	5
1	2	3	4	5	b. Prohibit repackaging of beef or reinforce declaring of doing so on the label	1	2	3	4	5

DESIRABILITY		FEASIBILITY
1 v. undesirable 2 undesirable 3 indeterminable 4 desirable 5 v. desirable		1 v. infeasible 2 infeasible 3 indeterminable 4 feasible 5 v. feasible
1 2 3 4 5	c. Encourage retailers to participate through all stages of beef production to the stage of retail ready product	1 2 3 4 5
1 2 3 4 5	d. Implement government control over beef product prices at retailing level in order to prevent excessive margins	1 2 3 4 5
	Encourage cooperation among all sectors in order to:	
1 2 3 4 5	e. Remove unnecessary costs and increase profits of all sectors	1 2 3 4 5
1 2 3 4 5	f. Create stable price for beef products at retailer level	1 2 3 4 5
1 2 3 4 5	g. Ensure competitive atmosphere among retailers	1 2 3 4 5
	Regarding trade of cattle and beef products	
1 2 3 4 5	a. Ensure access to other provinces	1 2 3 4 5
1 2 3 4 5	b. Protect from unfair competition	1 2 3 4 5
1 2 3 4 5	c. Sponsor freer trade with USA	1 2 3 4 5
1 2 3 4 5	d. Increase the emphasis on development of new market[illegible]d/or expansion of already existing	1 2 3 4 5
1 2 3 4 5	e. Promote international negotiations in order to keep health requirements as much uniform as possible	1 2 3 4 5
	Regarding research and its directions	
1 2 3 4 5	a. Increase government funding	1 2 3 4 5
1 2 3 4 5	b. Ensure producer involvement in research projects	1 2 3 4 5
1 2 3 4 5	c. Test animal health aids and growth stimulants for any residual effects before allowing industry to implement them	1 2 3 4 5
1 2 3 4 5	d. Develop efficient non-freezing beef storage technique	1 2 3 4 5
1 2 3 4 5	e. Help to develop new beef products meeting consumer preferences	1 2 3 4 5

DESIRABILITY v. undesirable 1	undesirable 2	indeterminable 3	desirable 4	v. desirable 5		FEASIBILITY v. infeasible 1	infeasible 2	indeterminable 3	feasible 4	v. feasible 5
1	2	3	4	5	f. Promote name branding of beef products	1	2	3	4	5
1	2	3	4	5	g. Support university and graduate student research training	1	2	3	4	5
1	2	3	4	5	h. Improve the transfer of technology (improve the extension effort)	1	2	3	4	5
1	2	3	4	5	i. Promote central coordination of government funds and facilities (avoid unnecessary costs and inconsistent projects)	1	2	3	4	5
					Support or facilitate efforts to present medically correct facts to the public regarding:					
1	2	3	4	5	j. Health aspects of beef as a food	1	2	3	4	5
1	2	3	4	5	k. Dietary aspects of beef as a food	1	2	3	4	5

Appendix D

A Copy of Round III Questionnaire

ALBERTA BEEF INDUSTRY TO 2000 - the third questionnaire

This questionnaire consists of two sections: Section I and Section II. The pretest showed that time required to complete this questionnaire is less than one hour.

Your comments on any question, statement, or interpretation are welcome; if more space is needed, please use a reverse side of a page.

SECTION I
PART A and PART B

BACKGROUND

Section I of the enclosed questionnaire contains:

1. Items generated by respondents in the first questionnaire as underlying assumptions of the predictions of changes in the Alberta beef industry.
2. A preliminary rating of these items according to importance and validity as determined by respondents in Round 2. The preliminary ratings are reported as low, high and mean (average) scores on the 5-point scale.

TASK

Your task is to:

1. Review all the items on the list.
2. Comment on any items you wish to clarify its meaning or your ranking.
3. Provide a final rating for each item in terms of its **importance** (importance as a factor in making the forecasts contained in this study; 1-low through to 5-high) and **the validity score** (likelihood of occurrence; 1-low through to 5-high) to each assumption/statement by using the importance and validity scales accordingly.

ATTENTION:

The description of each score in each scale is presented in the enclosed scales booklet.

IMPORTANCE									VALIDITY							
Low	High	Ave.	v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5	GENERAL ASSUMPTIONS/STATEMENTS	Low	High	Ave.	v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
								TECHNOLOGICAL CHANGES **Producing sector**								
3	5	4.1	1	2	3	4	5	a. Optimization of lean cattle production	2	5	3.8	1	2	3	4	5
2	5	3.4	1	2	3	4	5	b. More attention to individual animals performance	2	5	3.5	1	2	3	4	5
2	5	3.2	1	2	3	4	5	c. Increasing size of the average feedlot in order to capture benefits of economies of scale	2	5	3.5	1	2	3	4	5
2	5	3.1	1	2	3	4	5	d. Trend to large feedlots with central slaughtering facilities	1	5	3.1	1	2	3	4	5
1	5	3.2	1	2	3	4	5	e. Increase in range-fed cattle	1	5	3.1	1	2	3	4	5
1	5	3.1	1	2	3	4	5	f. The establishment of "futures" market for beef cattle	1	5	2.9	1	2	3	4	5
2	5	4.0	1	2	3	4	5	g. Diversification of agriculture by implementing new crops in order to maximize resource use and reduce income fluctuation risk	2	5	3.6	1	2	3	4	5
								Processing and retailing sector								
2	5	3.5	1	2	3	4	5	a. Electronic scanning will be used widely	1	5	3.5	1	2	3	4	5
1	5	2.8	1	2	3	4	5	b. More active role in custom feeding of cattle. The retail sector will likely be involved from feedlot operation to consumer; thereby affecting more control on pricing and profitability	2	5	3.2	1	2	3	4	5

IMPORTANCE								GENERAL ASSUMPTIONS/STATEMENTS - Continued	VALIDITY							
			v. unimportant	unimportant	indeterminable	important	v. important	INTERNATIONAL CONSIDERATIONS				v. unreliable	unreliable	indeterminable	reliable	v. reliable
Low	High	Ave.	1	2	3	4	5		Low	High	Ave.	1	2	3	4	5
2	5	4.2	1	2	3	4	5	a. No large scale importations of cheap meat beyond todays level	1	5	3.3	1	2	3	4	5
2	5	4.2	1	2	3	4	5	b. Loss of access to U.S. market, particularly Pacific North-West	1	5	3.2	1	2	3	4	5
								Development of new and/or expansion of already established export markets in:								
3	5	4.5	1	2	3	4	5	c. U.S.A.	2	5	3.8	1	2	3	4	5
2	5	4.1	1	2	3	4	5	d. Pacific Rim Countries	2	5	3.6	1	2	3	4	5
								Restrictions in the trade of:								
1	5	3.6	1	2	3	4	5	e. Beef between provinces	1	5	3.0	1	2	3	4	5
1	5	3.7	1	2	3	4	5	f. Cattle between provinces	1	5	3.0	1	2	3	4	5
2	5	4.3	1	2	3	4	5	g. Beef between Canada and USA	2	5	3.4	1	2	3	4	5
2	5	4.3	1	2	3	4	5	h. Cattle between Canada and USA	2	5	3.4	1	2	3	4	5
								Other International Considerations:								
2	5	4.2	1	2	3	4	5	i. Free trade with USA becomes a fact by the year 2000	2	5	3.4	1	2	3	4	5
3	5	3.9	1	2	3	4	5	j. The world surplus of wheat will continue	1	5	3.2	1	2	3	4	5

IMPORTANCE								GENERAL ASSUMPTIONS/STATEMENTS - Continued	VALIDITY							
Low	High	Ave.	1 v. unimportant	2 unimportant	3 indeterminable	4 important	5 v. important	**Economic Outlook**	Low	High	Ave.	1 v. unreliable	2 unreliable	3 indeterminable	4 reliable	5 v. reliable
2	5	3.9	1	2	3	4	5	a. The Canadian economy will not improve by the year 2000 resulting in decrease of disposable income	1	5	3.0	1	2	3	4	5
3	5	4.0	1	2	3	4	5	b. An upswing in the Canadian economy will take place in the 90's	1	5	3.2	1	2	3	4	5
2	5	3.6	1	2	3	4	5	c. Higher interest rates will prevail by the year 2000	1	5	2.6	1	2	3	4	5
2	5	3.7	1	2	3	4	5	d. Difficulties with obtaining new credits will continue	1	5	2.9	1	2	3	4	5
2	5	3.2	1	2	3	4	5	e. Alberta population will remain unchanged	1	4	2.7	1	2	3	4	5
								Production								
3	5	4.0	1	2	3	4	5	a. Increased competitiveness of beef will occur (with respect to other livestock production)	1	5	3.3	1	2	3	4	5
2	5	3.6	1	2	3	4	5	b. Cattle cycle no longer exists due to world supply of beef	1	5	2.5	1	2	3	4	5
1	5	3.5	1	2	3	4	5	c. The number of calves produced will not decline further because it is determined by availability of marginal land and residual feeds	1	5	2.6	1	2	3	4	5
1	5	3.5	1	2	3	4	5	d. The reduction of cow herd, to the point that feedlot and processing sectors will be forced out of business, will occur	1	5	3.1	1	2	3	4	5
1	5	3.7	1	2	3	4	5	e. Prevailing lower feed grain prices will have a greater impact on lowering costs of production for poultry and pork than for beef	2	5	3.5	1	2	3	4	5
1	5	3.8	1	2	3	4	5	f. Break out of disease (e.g. Food and Mouth) may occur in Canada	1	5	2.6	1	2	3	4	5

IMPORTANCE									VALIDITY							
Low	High	Ave.	v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5	**GENERAL ASSUMPTIONS/STATEMENTS** **Production - Continued**	Low	High	Ave.	v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
1	5	3.4	1	2	3	4	5	g. Major drought or extended period of dry weather will occur by the year 2000	1	5	2.7	1	2	3	4	5
2	5	3.7	1	2	3	4	5	h. New lands being opened are better suited for forage production	2	5	3.5	1	2	3	4	5
1	5	3.2	1	2	3	4	5	The place left by less efficient producers will be: i. Taken up by new entrants	2	5	3.3	1	2	3	4	5
1	5	3.1	1	2	3	4	5	j. Not taken up by more efficient producers since cow/calf operation is land based	1	5	2.8	1	2	3	4	5
3	5	4.2	1	2	3	4	5	**Government involvement** a. Rationalization of crow benefit issue (benefits paid to producer) or continuation of Alberta feed grain policy	2	5	3.6	1	2	3	4	5
1	5	3.5	1	2	3	4	5	b. Provincial government assistance on a consistent basis in order to manage cattle production as a enterprise producing more economic activity	1	4	2.9	1	2	3	4	5
2	5	3.9	1	2	3	4	5	c. Rationalization of government support programs across provinces leading to uniform approach	1	5	3.0	1	2	3	4	5
2	5	3.9	1	2	3	4	5	**Marketing and promotion** a. More aggressive and more innovative advertising and promotion of beef products will take place	1	5	3.6	1	2	3	4	5
1	5	3.3	1	2	3	4	5	A supply management marketing board will be: b. Established for cattle production	1	4	2.6	1	2	3	4	5
2	5	3.5	1	2	3	4	5	c. Established for pork production	1	5	3.2	1	2	3	4	5
2	5	3.8	1	2	3	4	5	d. Continued for poultry	2	5	4.0	1	2	3	4	5

IMPORTANCE								SPECIFIC ASSUMPTIONS/STATEMENTS	VALIDITY							
			v. unimportant	unimportant	indeterminable	important	v. important					v. unreliable	unreliable	indeterminable	reliable	v. reliable
Low	High	Ave.	1	2	3	4	5	**Assumptions/statements favoring the increase of beef consumption (in absolute and/or relative terms)**	Low	High	Ave.	1	2	3	4	5
2	5	4.0	1	2	3	4	5	a. Consumers will realize that beef is a source of comparatively low cost "valuable nutrients"	2	5	3.5	1	2	3	4	5
2	5	3.7	1	2	3	4	5	Consumers' preferences b. Consumption of poultry has reached its peak	1	5	2.6	1	2	3	4	5
2	5	3.4	1	2	3	4	5	c. Adverse publicity toward other food items	1	4	2.9	1	2	3	4	5
								Assumptions/statements leading to the decrease of beef consumption (in relative and/or absolute terms)								
2	5	3.8	1	2	3	4	5	a. White meat and pork processing innovations will continue at a faster pace (greater penetration of available market)	2	5	3.2	1	2	3	4	5
1	5	3.7	1	2	3	4	5	b. Increase in competition from other protein sources (e.g. vegetables)	1	5	3.5	1	2	3	4	5
								Assumptions/statements of a neutral nature or uncertain influence on consumption of beef (in absolute and relative terms)								
1	5	3.6	1	2	3	4	5	a. Per capital consumption will continue to be determined by herd production which tends to go in 10 year cycles modified by product price, price of competitive products and cost of inputs	1	5	3.5	1	2	3	4	5
								Assumptions/statements favoring the increase of Alberta beef industry's share in the national market of feeders, slaughter cattle and/or carcasses								
2	5	3.9	1	2	3	4	5	a. The gap between transportation rates of live cattle and dressed beef will widen	2	5	3.5	1	2	3	4	5
2	5	3.6	1	2	3	4	5	b. Increased demand for Alberta feeders from other provinces and USA	1	4	2.9	1	2	3	4	5

IMPORTANCE									VALIDITY							
Low	High	Ave.	v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5	SPECIFIC ASSUMPTIONS/STATEMENTS - Continued	Low	High	Ave.	v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
								Assumptions/statements leading to decrease of Alberta beef industry's share in the national market of feeders, slaughter cattle and/or carcasses								
2	5	3.9	1	2	3	4	5	a. Increased number of cattle slaughter shipped across the U.S. border due to the failure of Alberta plants to meet low cost of operation of US plants (higher efficiency and/or lower labor costs)	2	5	3.1	1	2	3	4	5
2	5	3.4	1	2	3	4	5	b. One plant in North-Central region of Alberta will close without offsetting increase in capacity by existing plants or by new plant	1	4	2.9	1	2	3	4	5
								Assumptions/statements of a neutral nature or uncertain influence on Alberta beef industry's share in the national market of feeders, slaughter cattle and/or carcasses								
2	5	3.9	1	2	3	4	5	a. The Montreal market remains the major market for Alberta beef	2	5	3.3	1	2	3	4	5
2	5	4.0	1	2	3	4	5	b. Saskatchewan has the ability to increase significantly its role in national beef industry thereby decreasing Alberta's share; however this is not likely to occur	2	5	3.5	1	2	3	4	5
1	5	3.8	1	2	3	4	5	c. Alberta has appropriate facilities and therefore everything that is produced will be fed and slaughtered in Alberta in order to avoid unnecessary costs	1	4	3.1	1	2	3	4	5
2	5	3.4	1	2	3	4	5	d. No significant change in the meat aging process and continuation of using transit time and transport resources as aging facilities	1	4	2.9	1	2	3	4	5
								The assumptions favoring the expansion of feeding and/or processing industry in southern Alberta (census divisions 1-6) The further concentration of feedlot industry in Southern Alberta will take place due to:								
2	5	3.9	1	2	3	4	5	a. The lowest cost of production (larger units with high level of expertise)	2	5	3.2	1	2	3	4	5
1	5	3.0	1	2	3	4	5	b. Overcapacity of facilities	1	5	3.2	1	2	3	4	5
1	5	3.5	1	2	3	4	5	c. More assurance of feed in irrigation areas and that irrigation will continue as subsidy to feed production	1	5	3.2	1	2	3	4	5

IMPORTANCE									VALIDITY							
Low	High	Ave.	v. unimportant 1	unimportant 2	indeterminable 3	important 4	v. important 5	**SPECIFIC ASSUMPTIONS/STATEMENTS - Continued**	Low	High	Ave.	v. unreliable 1	unreliable 2	indeterminable 3	reliable 4	v. reliable 5
1	4	2.9	1	2	3	4	5	d. Higher protein feeds	1	4	3.2	1	2	3	4	5
1	4	3.2	1	2	3	4	5	e. Reduction of cattle number in Peace River area	2	4	2.8	1	2	3	4	5
2	5	3.4	1	2	3	4	5	The further concentration of processing industry in Southern Alberta will take place due to: a. Plants in south continuing to modernize more on average than other plants in Alberta	1	5	3.2	1	2	3	4	5
1	4	2.8	1	2	3	4	5	b. Supply of cattle with higher dressing percentage	1	5	2.8	1	2	3	4	5
2	5	3.9	1	2	3	4	5	c. The feeder cattle backgrounded in the North-Central region being shipped to Southern region for feedlot finishing	1	5	3.4	1	2	3	4	5
								The assumptions not favoring the expansion of feeding and/or processing industry in Southern Alberta								
2	5	3.8	1	2	3	4	5	The following factors will result in the decrease of feedlot and packing (processing) industry concentration in Southern Alberta a. Small feedlots of 1000-2000 head capacity are starting to develop in North-Central region. This size of feedlot will be competitive with large feedlots in South, both in production and marketing costs	2	4	3.1	1	2	3	4	5
2	5	3.7	1	2	3	4	5	b. Higher cost of irrigation in South will force irrigated land into higher returning cash crops rather than feed	2	5	3.4	1	2	3	4	5
2	5	3.4	1	2	3	4	5	c. Good supply of finished cattle will establish bases for slaughter facility in North-Central region	1	4	2.8	1	2	3	4	5
1	5	3.1	1	2	3	4	5	d. Government attempts through programs and regulation to spread out the industry	1	4	2.4	1	2	3	4	5

SECTION II

This section deals with the evaluation of programs proposed by the panel as being required in the beef industry.

BACKGROUND

Section II of the enclosed questionnaire contains:

1. A listing of proposed programs/policies identified by study respondents in Round 1.
2. A preliminary rating of these policy needs according to desirability and feasibility. The preliminary ratings are reported as low, high and average scores on the 5-point scale.

TASK

Your task is to:

1. Review all the items on the list.
2. Comment on any items you wish to clarify its meaning or your ranking.
3. Provide a final rating for each item in terms of its **desirability** (the degree to which something should be done; 1-low through to 5-high) and **feasibility** (the degree to which something can be done; 1-low through to 5-high).

ATTENTION:

The description of each score in each scale is presented in the enclosed scales booklet.

DESIRABILITY												FEASIBILITY				
Low	High	Ave.	v. undesirable 1	undesirable 2	indeterminable 3	desirable 4	v. desirable 5	**PROPOSED PROGRAMS IN THE ALBERTA BEEF INDUSTRY** **Regarding government programs at producer level:**	Low	High	Ave.	v. infeasible 1	infeasible 2	indeterminable 3	feasible 4	v. feasible 5
2	5	4.2	1	2	3	4	5	a. Correct the distortions created by programs already implemented	2	5	3.5	1	2	3	4	5
3	5	4.6	1	2	3	4	5	b. Do not implement new programs leading to distortion of marketing signals	2	5	3.5	1	2	3	4	5
1	5	2.7	1	2	3	4	5	c. If idea of uniform approach will not succeed implement programs challenging those of other provinces	2	5	3.4	1	2	3	4	5
2	5	3.7	1	2	3	4	5	d. If method of payment is not solved continue feed grain market adjustment program	2	5	3.5	1	2	3	4	5
1	4	2.2	1	2	3	4	5	e. Subsidize production in order to ensure utilization of existing processing capacity in Alberta	1	4	2.8	1	2	3	4	5
1	5	3.2	1	2	3	4	5	Tax policies: f. In and out producers should be excluded from benefits such as tax write offs, subsidy, etc.	1	5	2.9	1	2	3	4	5
2	5	3.9	1	2	3	4	5	g. Instead of price supports reduce taxes in inputs	1	5	3.0	1	2	3	4	5
1	5	4.0	1	2	3	4	5	h. Create an income stabilization trust provision in the tax law, which farmers can use at their option	2	5	3.6	1	2	3	4	5

PROPOSED PROGRAMS IN THE ALBERTA BEEF INDUSTRY - Continued

DESIRABILITY										FEASIBILITY							
			v. undesirable	undesirable	indeterminable	desirable	v. desirable					v. infeasible	infeasible	indeterminable	feasible	v. feasible
Low	High	Ave.	1	2	3	4	5		Low	High	Ave.	1	2	3	4	5
								Regarding government programs at processing level:								
1	4	2.9	1	2	3	4	5	a. Provide establishment and capitalization support	1	4	3.2	1	2	3	4	5
1	5	2.8	1	2	3	4	5	b. Do not allow new processing plants into the market when overcapacity exists	1	5	2.9	1	2	3	4	5
3	5	4.4	1	2	3	4	5	c. Introduce "open shop" legislation in order that employees have choice as to whether to belong to the union or not	2	5	3.6	1	2	3	4	5
1	5	3.4	1	2	3	4	5	d. Allow plants to buy their own coverage of workmen's compensation	1	5	3.1	1	2	3	4	5
1	5	2.7	1	2	3	4	5	e. Allow plants designated only for export production to meet only importer's standards	1	5	2.8	1	2	3	4	5
2	5	4.0	1	2	3	4	5	f. Ensure more effective use of existing inspectors and veterinary personnel in order to build up consumer confidence in quality of beef products	2	5	3.6	1	2	3	4	5
1	5	4.1	1	2	3	4	5	g. Improve price discovery between processors and retailers	1	5	3.1	1	2	3	4	5
								Grading system:								
2	5	4.0	1	2	3	4	5	h. Base payment on edible red meat content	2	5	3.6	1	2	3	4	5
1	5	3.4	1	2	3	4	5	i. Remove discounts on carcasses over 800 lbs in order to ensure more efficient processing	2	5	3.3	1	2	3	4	5
2	5	3.9	1	2	3	4	5	j. Supplement grading system by having export market grades meeting requirements of major importers	2	5	3.8	1	2	3	4	5
2	5	3.9	1	2	3	4	5	k. Reduce the cost recovery from grading since the quality assurance is also a benefit to consumer	2	5	3.6	1	2	3	4	5

DESIRABILITY								PROPOSED PROGRAMS IN THE ALBERTA BEEF INDUSTRY - Continued	FEASIBILITY							
Low	High	Ave.	v. undesirable 1	undesirable 2	indeterminable 3	desirable 4	v. desirable 5		Low	High	Ave.	v. infeasible 1	infeasible 2	indeterminable 3	feasible 4	v. feasible 5
								Regarding government programs at retailing level:								
1	5	3.5	1	2	3	4	5	a. Prohibit repackaging of beef or reinforce declaring of doing so on the label	1	5	3.6	1	2	3	4	5
1	5	3.0	1	2	3	4	5	b. Encourage retailers to participate through all stages of beef production to the stage of retail ready product	1	5	2.6	1	2	3	4	5
								Encourage cooperation among all sectors in order to:								
3	5	4.2	1	2	3	4	5	c. Remove unnecessary costs and increase profits of all sectors	2	5	3.5	1	2	3	4	5
1	5	2.7	1	2	3	4	5	d. Create stable price for beef products at retailer level	1	4	2.5	1	2	3	4	5
3	5	4.0	1	2	3	4	5	e. Ensure competitive atmosphere among retailers	1	5	3.3	1	2	3	4	5
								Regarding trade of cattle and beef products								
2	5	4.2	1	2	3	4	5	a. Protect from unfair competition from other countries	2	5	3.5	1	2	3	4	5
								Regarding research and its directions								
3	5	4.4	1	2	3	4	5	b. Develop efficient non-freezing beef storage technique	1	5	3.7	1	2	3	4	5
3	5	4.2	1	2	3	4	5	c. Promote central coordination of governmment funds and facilities (avoid unnecessary costs and inconsistent projects)	2	5	3.6	1	2	3	4	5

Appendix E

The Code Book of Items Presented for the Evaluation Process

Appendix E. The Code Book, Alberta, 1986

CODE (1)	DESCRIPTION OF THE ITEM (2)
TECHNOLOGICAL CHANGES:	
a. at the producer level:	
A 1	Increase in reproductive efficiency
A 2	Improved feeding efficiency
A 3	Improved health protection
A 4	Increased use of forage in feeding
A 5	Optimization of lean cattle production
A 6	Increased use of residuals of crop production
A 7	More backgrounding
A 8	Increased weaning weights
A 9	More attention to individual animals performance
A10	Increasing size of the average feedlot in order to capture benefits of economies of scale
A11	Trend to large feedlots with central slaughtering facilities
A12	A return to conventional breeds
A13	Increase in range-fed cattle

Continued...

Appendix E. (Continued)

(1)	(2)
A14	The establishment of "futures" market for beef cattle
A15	Diversification of agriculture by implementing new crops in order to maximize resource use and reduce income fluctuation risk
A16	Survivors will have more equity and less debt
A17	Computer programs which enable cost analysis of feeding cattle
b. at processor and retailer levels:	
A18	Further rationalization of packing plants will take place
A19	Development of an objective method for determining carcass value
A20	Changes in processing techniques
A21	Changes in product design and packaging
A22	Electronic scanning will be used widely
A23	Blending meats from different species into specialty hamburgers
A24	Possible purchase of meat directly from home by computer
A25	More active role in custom feeding of cattle. The retail sector will likely be involved from feedlot operation to consumer; thereby affecting more control on pricing and profitability

Continued...

Appendix E. (Continued)

(1)	(2)
INTERNATIONAL CONSIDERATIONS:	
A26	No large scale importations of cheap meat beyond todays level
A27	Loss of access to U.S. market, particularly Pacific North-West
A28	Development of new and/or expansion of already established export markets in USA
A29	Development of new and/or expansion of already established export markets in Pacific Rim Countries
A30	Further increase in the quantity of beef from Western Canada sold in Pacific North-West of USA
A31	Restrictions in the trade of beef between provinces
A32	Restrictions in the trade of cattle between provinces
A33	Restrictions in the trade of beef between Canada and USA
A34	Restrictions in the trade of cattle between Canada and USA
A35	Free trade with USA becomes a fact by the year 2000
A36	The world surplus of wheat will continue
A37	The world surplus of vegetable oils will continue
A38	Increased prices of vegetables protein as a result of lack of water in major growing areas of USA

Continued...

Appendix E. (Continued)

(1)	(2)
GENERAL ASSUMPTIONS:	
a. Economic outlook:	
A39	The Canadian economy will not improve by the year 2000 resulting in decrease of disposable income
A40	An upswing in the Canadian economy will take place in the 90's
A41	Higher interest rates will prevail by the year 2000
A42	Difficulties with obtaining new credits will continue
A43	Alberta population will remain unchanged
A44	Canadian population is aging
A45	Increased prices of agricultural machinery will favor beef production
A46	The beef industry is a mature industry
b. Production:	
A47	The herd rebuilding phase of the cattle cycle will take place by the end of the 90's
A48	The optimism of rebuilding phase of cycle will be dampened by limitations in price imposed by competitive meats whose price cycles are not in phase with beef
A49	The optimism of rebuilding phase of cycle will be enhanced by prospects of lower grain prices

Continued...

Appendix E. (Continued)

(1)	(2)
A50	Increased competitiveness of beef will occur
A51	The place left by less efficient producers will be taken up by new entrants
A52	The place left by less efficient producers will be not taken up by more efficient producers since cow/calf operation is land based
A53	Cattle cycle no longer exists due to world supply of beef
A54	The number of calves produced will not decline further because it is determined by availability of marginal land and residuals feeds
A55	The reduction of cow herd, to the point that feedlot and processing sectors will be forced out of business, will occur
A56	Rising inputs, processing and retailing costs will squeeze out producers with lower efficiency
A57	Prevailing lower feed grain prices will have a greater impact on lowering costs of production for poultry and pork than for beef
A58	Break out of disease (e.g. Food and Mouth) may occur in Canada
A59	Major drought or extended period of dry weather will occur by the year 2000

Continued...

Appendix E. (Continued)

(1)	(2)
A60	New lands being opened are better suited for forage production
A61	Recreational pressure. on some good land will be more than offset by shift of marginal land from cash crop production to beef production
c. Government involvement:	
A62	Rationalization of crow benefit issue (benefits paid to producer) or continuation of Alberta feed grain policy
A63	Continued role of government interfering with true market signals and causing distortions to production decisions
A64	Provincial government assistance on a consistent basis in order to manage cattle production as an enterprise producing more economic activity
A65	Rationalization of government support programs across provinces leading to uniform approach
A66	Government policies to reduce large swings in beef prices so that people become accustomed to a price

Continued...

Appendix E. (Continued)

(1)	(2)
d. Marketing and promotion:	
A67	More aggressive and more innovative advertising and promotion of beef products will take place
A68	Research and industry effort will alleviate many health concerns
A69	Beef will lose its attraction as a loss leader in retailing
A70	A supply management marketing board will be established for cattle production
A71	A supply management marketing board will be established for pork production
A72	A supply management marketing board will be continued for poultry
e. Consumers' preferences:	
A73	Trend to smaller servings, lower calorie intake
A74	Consumer preferences will continue changing toward light and convenient foods
A75	Consumption of meat has plateaued at a level of around 200 lbs per capita and will remain similar until the year 2000
A76	Consumption of poultry has reached its peak

Continued...

Appendix E. (Continued)

(1)	(2)
SPECIFIC ASSUMPTIONS I:	
a. Favoring the increase of beef consumption:	
B 1	Consumers will realize that beef is a source of comparatively low cost "valuable nutrients"
B 2	Beef will continue to be a preferred meat due to its favor
B 3	Adverse publicity toward other food items
B 4	Beef hamburgers will continue to be the main form of meat consumption
b. Leading to the decrease of beef consumption:	
B 5	White meat and pork processing innovations will continue at a faster pace (greater penetration of available market)
B 6	Increase in competition from other protein sources (e.g. vegetables)
B 7	Increasing popularity of poultry in fast food outlets
c. Exhibiting neutral influence on beef consumption:	
B 8	Increased demand for white veal
B 9	The consumption of beef is more affected by changes in disposable income than other meats

Continued...

Appendix E. (Continued)

(1)	(2)
B10	Per capita consumption will continue to be determined by herd production which tends to go in 10 year cycles modified by product price, price of competitive products and cost of inputs
B11	Lack of cooperation in order to change selling techniques at retail store level (both in percent of profit and changing style of cuts)
SPECIFIC ASSUMPTIONS II:	
a. Favoring the increase in importance of the Alberta beef industry:	
C 1	Alberta will continue to have natural comparative advantage (land, climate, capital, and expertise)
C 2	Dairy-beef cow numbers will decline more in East as dairy products build up
C 3	The gap between transportation rates of live cattle and dressed beef will widen
C 4	Increased demand for Alberta feeders from other provinces and USA
b. Leading to the decrease in importance of the Alberta beef industry:	
C 5	Increased numbers of slaughter cattle shipped across the U.S. border due to the failure of Alberta plants to meet low cost of operation of U.S. plants (higher efficiency and/or lower labor costs)
C 6	U.S. processors establishing new plants close to the border to draw finished animals to USA

Continued...

Appendix E. (Continued)

(1)	(2)
C 7	Overcapacity and low margins do not favor new plants in Alberta
C 8	One plant in North-Cental region of Alberta will close without offsetting increase in capacity by existing plants or by new plant
c. Exhibiting neutral influence on importance of the Alberta beef industry:	
C 9	The Montreal market remains the major market for Alberta beef
C10	Saskatchewan has the ability to increase significantly its role in national beef industry thereby decreasing Alberta's share; however this is not likely to occur
C11	Ontario, Quebec, Manitoba have more production options for their available land base and can obtain better payback from subsidization of operations other than beef
C12	During herd rebuilding stage the cow herd numbers will shift to Saskatchewan and Alberta and build around mixed grain/beef cow economy
C13	Alberta has appropriate facilities and therefore everything that is produced will be fed and slaughtered in Alberta in order to avoid unnecessary costs
C14	No significant change in the meat aging process and continuation of using transit time and transport resources as aging facilities

Continued...

Appendix E. (Continued)

(1)	(2)
SPECIFIC ASSUMPTIONS III:	
a. Favoring the expansion of feedlot industry in the Southern region:	
D 1	The lowest cost of production (larger units with high level of expertise)
D 2	Overcapacity of facilities
D 3	Closeness to alternate markets
D 4	Producers in South being risk takers (a necessary attitude in feedlot business)
D 5	More moderate winter climate
D 6	More assurance of feed in irrigation areas and that irrigation will continue as subsidy to feed production
D 7	Higher protein feeds
D 8	Reduction of cattle number in Peace River area
b. Favoring the expansion of processing industry in the Southern region:	
D 9	Plants in South continuing to modernize more on average than other plants in Alberta
D10	Supply of cattle with higher dressing percentage

Continued...

Appendix E. (Continued)

(1)	(2)
D11	Closeness to alternate markets
D12	The feeder cattle backgrounded in the North-Central region being shipped to Southern region for feedlot finishing
c. Not favoring further expansion of the beef industry in the Southern region:	
D13	Small feedlots of 1000-2000 head capacity are starting to develop in North-Central region. This size of feedlot will be competitive with large feedlots in South, both in production and marketing costs
D14	North-Central region is better suited to grow forage what will lead to backgrounding feeder cattle
D15	Higher price differential on grain between both regions
D16	Increasing transportation costs
D17	Availability of feeder cattle in North-Central region will continue and even increase
D18	Higher cost of irrigation in South will force irrigated land into higher returning cash crops rather than feed
D19	Good supply of finished cattle will establish bases for slaughter facility in North-Central region
D20	Government attempts through programs and regulation to spread out the industry

Continued...

Appendix E. (Continued)

(1)	(2)
GOVERNMENT PROGRAMS:	
a. At the producer level:	
E 1	Correct the distortions created by programs already implemented
E 2	Do not implement new programs leading to distortion of marketing signals
E 3	Increase infrastructure development
E 4	Promote an uniform stabilization program
E 5	If idea of uniform approach will not succeed implement programs challenging those of other provinces
E 6	Ensure that Western Grain Transportation subsidies will be paid to producers
E 7	If method of payment is not solved continue feed grain market adjustment
E 8	Discontinue or reform policies leading to cropping of the marginal land
E 9	Stop excessive loss insurance programs which are in reality subsidy programs
E10	Develop program supporting the conservation of land resources
E11	Subsidize production in order to ensure utilization of existing processing capacity in Alberta
E12	Allow for asset transfer from financially troubled producer; do not support moratoriums and debt write downs

Continued...

Appendix E. (Continued)

(1)	(2)
E13	In and out producers should be excluded from benefits such as tax write offs, subsidy, etc.
E14	Instead of price supports reduce taxes on inputs
E15	Create an income stabilization trust provision in the tax law, which farmers can use at their option
b. at the processing level:	
E16	Provide establishment and capitalization support
E17	Provide tax subsidies for modernization of plants
E18	Allow obsolete plants to close
E19	Do not allow new processing plants into market when overcapacity exists
E20	Ensure competitive atmosphere among plants
E21	Introduce "open shop" legislation in order that employees have choice as to whether to belong to the union or not
E22	Allow plants to buy their own coverage of workmen's compensation
E23	Allow plants designated only for export production to meet only importer's standards

Continued...

Appendix E. (Continued)

(1)	(2)
E24	Ensure more effective use of existing inspectors and veterinary personnel in order to build up consumer confidence in quality of beef products
E25	Improve price discovery between processors and retailers
E26	Base payment on edible red meat content
E27	Remove discounts on carcasses over 800 lbs in order to ensure more efficient processing
E28	Supplement grading system by having export market grades meeting requirements of major importers
E29	Reduce the cost recovery from grading since the quality assurance is also a benefit to consumer
c. At the retailing level	
E30	Encourage new marketing strategies for beef products
E31	Prohibit repackaging of beef or reinforce declaring of doing so on the label
E32	Encourage retailers to participate through all stages of beef production to the stage of retail ready product
E33	Implement government control over beef product prices at retailing level in order to prevent excessive margins

Continued...

Appendix E. (Continued)

(1)	(2)
E34	Remove unnecessary costs and increase profits of all sectors
E35	Create stable price for beef products at retailer level
E36	Ensure competitive atmosphere among retailers
d. Regarding trade of cattle and beef products:	
E37	Ensure access to other provinces
E38	Protect from unfair competition
E39	Sponsor freer trade with USA
E40	Increase the emphasis on development of new markets and/or expansion of already existing
E41	Promote international negotiations in order to keep health requirements as much uniform as possible
e. Regarding research and its directions:	
E42	Increase government funding
E43	Ensure producer involvement in research projects
E44	Test animal health aids and growth stimulants for any residual effects before allowing industry to implement them

Continued...

Appendix E. (Continued)

(1)	(2)
E45	Develop efficient non-freezing beef storage technique
E46	Help to develop new beef products meeting consumer preferences
E47	Promote name branding of beef products
E48	Support university and graduate student research training
E49	Improve the transfer of technology (improve the extension effort)
E50	Promote central coordination of government funds and facilities (avoid unnecessary costs and inconsistent projects)
E51	Support and facilitate efforts to present medically correct facts to the public regarding health aspects of beef as a food
E52	Support and facilitate efforts to present medically correct facts to the public regarding dietary aspects of beef as a food

Appendix F

The Results of Round II Evaluation Process

Appendix F. The Results of the Second Round Evaluation Process, Alberta, 1986

CODE	IMPORTANCE RATING			VALIDITY RATING		
(1)	Median (2a)	Q value (2b)	Resp. (2c)	Median (3a)	Q value (3b)	Resp. (3c)
TECHNOLOGICAL CHANGES:						
A 1	4.38	0.87	25	4.03	0.70	25
A 2	4.29	0.92	25	4.20	0.83	25
A 3	4.32	0.81	25	4.12	0.74	25
A 4	3.91	1.22	25	3.55	1.16	25
A 5	4.19	1.30	25	3.81	1.53	25
A 6	3.82	0.99	25	3.63	1.12	25
A 7	3.62	1.10	23	3.62	1.16	23
A 8	3.96	0.92	25	3.86	0.95	24
A 9	3.44	1.48	25	3.50	1.34	24
A10	3.15	1.36	25	3.50	1.42	24
A11	3.05	1.33	26	3.15	1.36	25
A12	2.05	1.04	26	2.61	1.74	26
A13	3.24	1.64	26	3.09	1.23	25
A14	2.98	1.84	24	2.90	1.46	23
A15	4.04	1.00	26	3.61	1.31	26
A16	4.09	1.09	25	3.87	1.23	24
A17	4.00	0.96	25	3.96	0.89	25

Continued...

Appendix F. (Importance and Validity Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
A18	4.31	0.86	25	4.22	1.16	25
A19	4.24	1.03	26	4.00	0.80	26
A20	4.21	0.81	28	4.05	0.93	27
A21	4.54	0.81	28	4.06	0.78	28
A22	3.50	1.47	28	3.37	1.53	28
A23	3.00	1.12	27	3.05	0.94	27
A24	2.41	1.21	28	3.00	1.09	27
A25	2.86	1.25	28	3.13	1.19	28
INTERNATIONAL CONSIDERATIONS:						
A26	4.30	1.27	27	4.06	1.70	27
A27	4.42	1.29	27	3.23	1.58	27
A28	4.56	0.78	28	3.89	1.26	27
A29	4.14	1.15	28	3.65	1.52	27
A30	4.59	0.73	28	3.93	0.93	27
A31	3.79	2.27	27	2.93	2.21	27
A32	3.97	2.04	27	3.07	2.06	27
A33	4.61	0.95	27	3.60	1.60	26
A34	4.61	0.95	27	3.50	1.41	26
A35	4.50	1.41	28	3.39	1.26	27
A36	3.81	1.19	27	3.24	1.34	28
A37	3.35	1.06	27	3.09	0.82	28
A38	3.04	1.01	27	3.00	0.78	28

Continued...

Appendix F. (Importance and Validity Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
GENERAL ASSUMPTIONS:						
A39	3.89	1.44	27	3.50	1.10	27
A40	4.00	1.25	27	3.24	1.34	28
A41	3.29	1.68	26	2.72	1.10	27
A42	3.67	1.33	25	2.95	1.35	26
A43	3.22	1.39	25	2.65	1.75	26
A44	3.97	0.87	26	4.22	0.85	26
A45	3.21	1.12	25	3.00	0.92	26
A46	4.11	1.22	26	4.06	0.95	26
A47	3.65	1.16	25	3.29	1.15	25
A48	4.03	0.87	26	3.79	1.02	27
A49	3.95	0.65	26	3.61	1.06	27
A50	4.02	0.79	24	3.58	1.42	24
A51	3.29	1.71	25	3.29	1.70	25
A52	3.06	1.64	25	2.81	1.60	25
A53	3.76	1.42	24	2.35	1.95	26
A54	3.56	1.50	23	2.56	1.66	25
A55	3.69	1.47	24	3.25	1.88	25
A56	4.07	0.93	26	4.06	0.79	26
A57	3.82	1.28	25	3.67	1.81	25
A58	4.00	1.84	25	3.52	1.42	25
A59	3.26	1.35	26	2.76	1.48	26

Continued...

Appendix F. (Importance and Validity Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
A60	3.71	1.46	24	3.71	1.01	24
A61	3.18	1.06	24	3.45	1.22	23
A62	4.27	0.99	25	3.76	1.27	25
A63	4.12	0.98	26	3.92	0.68	27
A64	3.61	1.44	26	2.89	1.59	26
A65	3.92	1.75	26	2.92	1.82	26
A66 (*)	3.00	1.22	26	2.81	1.65	25
A67	3.96	0.99	27	3.84	1.33	27
A68	4.17	0.93	27	3.88	1.05	27
A69	3.18	1.23	25	3.18	1.20	25
A70	3.22	1.91	25	2.50	1.64	26
A71	3.44	1.66	25	3.08	0.85	26
A72	3.91	1.26	26	4.04	0.96	27
A73	4.33	0.92	26	4.11	0.71	27
A74	4.09	0.78	25	4.00	0.80	26
A75	4.07	0.93	26	3.83	1.17	27
A76	3.81	1.67	25	2.50	1.52	26
SPECIFIC ASSUMPTIONS I:						
B 1	4.06	0.88	28	3.76	1.36	28
B 2	4.27	0.84	27	3.91	0.70	28
B 3	3.31	1.24	27	2.86	1.35	28
B 4	4.03	0.85	27	3.78	1.00	28

Continued...

Appendix F. (Importance and Validity Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
B 5	3.84	0.93	27	3.28	1.46	28
B 6	3.88	1.13	27	3.70	1.34	28
B 7	3.94	0.79	27	3.78	1.08	28
B 8	2.50	1.21	26	2.46	1.44	27
B 9	3.97	0.67	27	3.87	1.03	28
B10	3.80	1.40	26	3.82	1.32	27
B11	3.78	1.21	26	2.85	0.86	27
SPECIFIC ASSUMPTIONS II:						
C 1	4.50	0.79	26	4.24	0.80	26
C 2	3.79	1.00	24	3.50	1.14	24
C 3	3.96	1.13	25	3.72	1.25	26
C 4	3.75	1.25	25	2.89	1.44	26
C 5	3.97	0.78	25	3.06	1.66	26
C 6	3.11	1.50	25	2.24	1.03	26
C 7	4.15	0.94	25	3.98	0.63	25
C 8	3.35	1.30	25	2.89	1.39	26
C 9	3.96	0.93	24	3.54	1.67	25
C10	4.03	0.70	25	3.74	1.25	26
C11	3.83	0.89	24	3.67	1.20	25
C12	3.96	1.10	25	3.57	1.18	26
C13	3.88	1.19	25	3.25	1.68	25
C14	3.50	1.46	24	2.67	2.10	25

Continued...

Appendix F. (Importance and Validity Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
SPECIFIC ASSUMPTIONS III:						
D 1	3.96	0.89	25	3.38	1.83	25
D 2	2.96	1.71	25	3.62	1.85	25
D 3	3.87	0.75	24	3.81	0.85	24
D 4 (*)	3.29	1.20	25	2.93	1.58	26
D 5	3.80	1.16	25	3.88	0.74	25
D 6	3.71	1.35	25	3.33	1.77	26
D 7	2.94	1.59	22	3.50	1.66	24
D 8	3.44	1.32	25	2.78	1.03	26
D 9	3.44	1.27	25	3.42	1.64	25
D10	2.86	1.55	24	2.51	1.86	25
D11	3.75	1.09	25	3.72	1.21	26
D12	3.93	0.83	25	3.71	1.73	26
D13	3.93	0.86	24	3.20	1.74	25
D14	3.96	0.80	24	3.95	0.66	25
D15	3.59	1.18	24	3.22	1.19	24
D16	3.67	1.20	24	3.54	1.22	23
D17	3.86	0.95	24	3.72	1.00	25
D18	3.76	1.32	24	3.44	1.33	25
D19	3.58	1.30	24	2.69	1.44	25
D20	3.26	1.59	24	2.38	1.52	24

"(*)" means that item was discarded due to a calculation error

Appendix F. The Results of The Second Round Evaluation Process (Continued), Alberta, 1986

CODE	DESIRABILITY RATING			FEASIBILITY RATING		
	Median	Q value	Resp.	Median	Q value	Resp.
(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
GOVERNMENT PROGRAMS:						
E 1	4.50	0.97	26	3.59	1.31	26
E 2	4.62	0.68	26	3.66	1.29	26
E 3	3.04	0.72	21	2.97	0.66	21
E 4	3.88	1.14	26	3.57	1.17	26
E 5	2.58	1.72	23	3.44	1.36	23
E 6	4.33	0.92	26	3.74	1.08	26
E 7	3.80	1.23	26	3.50	1.42	26
E 8	3.74	1.08	24	3.15	1.05	25
E 9 (*)	4.00	0.92	26	3.32	1.29	26
E10	4.50	0.85	26	3.98	0.99	26
E11	2.11	1.41	26	2.76	1.52	26
E12	4.00	1.20	25	3.54	1.13	25
E13	3.24	1.27	26	2.73	1.45	26
E14	4.04	0.93	24	2.50	2.24	24
E15	4.14	1.09	26	3.61	1.39	26
E16	3.02	1.91	26	3.44	1.32	25
E17 (*)	3.67	1.72	26	3.71	1.21	26

Continued...

Appendix F. (Desirability and Feasibility Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
E18	4.23	0.90	25	3.89	0.96	25
E19	2.60	2.01	25	2.86	1.67	25
E20	4.20	0.94	26	3.83	1.08	26
E21	4.45	0.85	25	3.79	1.36	25
E22	3.44	1.36	23	3.19	1.45	23
E23	2.54	1.68	25	2.58	1.67	25
E24	4.11	1.25	26	3.76	1.37	26
E25	4.26	0.95	26	3.50	1.86	26
E26	4.09	1.06	26	3.77	1.44	25
E27	3.56	1.57	25	3.38	1.38	24
E28	3.96	0.95	26	3.85	1.37	25
E29	3.93	0.98	26	3.82	1.58	25
E30	4.50	0.83	28	4.03	0.85	27
E31	3.50	1.52	24	3.70	1.51	23
E32	3.13	2.21	25	2.38	1.39	25
E33	2.64	1.59	28	1.89	1.07	27
E34	4.20	0.87	27	3.76	1.43	28
E35	2.50	1.94	28	2.88	1.75	28
E36	3.96	0.97	28	3.34	1.74	28
E37	4.68	0.32	27	4.09	1.19	27

Continued...

Appendix F. (Desirability and Feasibility Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
E38	4.34	1.06	27	3.67	1.27	27
E39	4.55	0.95	27	3.83	1.11	27
E40	4.58	0.72	27	4.14	0.75	27
E41	4.55	0.77	27	3.85	0.83	26
E42	4.50	1.18	26	3.80	1.17	26
E43	4.21	1.12	26	4.00	1.22	26
E44	4.42	0.69	26	4.03	0.87	26
E45	4.41	0.78	28	3.83	1.26	28
E46	4.61	0.61	28	4.11	0.78	28
E47 (*)	3.86	1.38	28	3.78	1.12	28
E48	4.22	0.78	28	4.20	0.81	28
E49	4.28	0.80	27	4.06	0.71	27
E50	4.26	1.05	27	3.63	1.67	28
E51	4.65	0.46	28	4.50	0.94	28
E52	4.63	0.54	28	4.42	0.95	28

"(*)" means that item was discarded due to a calculation error

Appendix F. The Evaluation of Factors of Change Accompanying Important and Valid Common Headings, Alberta, 1986

Code (1)	Common Headings and Associated Factors of Change (2)	Number of Responses Agree (3)	 Disagree (4)	 Total (5)
A 1	Increase in reproductive efficiency			
	- improved management techniques	25	0	25
	- twinning	11	13	24
A 2	Improved feeding efficiency			
	- improvement of genetic characteristics	24	1	25
	- improved feeds and feeding formulas	24	1	25
	- increased use of micronutrients	18	7	25
	- broader use of implant type growth stimulants, hormones and/or neutralizers of growth inhibitors	16	9	25
A 3	Improved health protection			
	- prevention of shipping diseases	24	1	25
	- further development of vaccine treatment of cattle diseases	24	1	25
	- control of livestock pests	24	2	26
	- improved health management techniques	24	1	25
A 4	Increased use of forage in feeding			
	- development of new more productive and/or higher nutritional quality varietas	23	1	24
	- increased area under irrigation	10	13	23
	- new methods of harvesting and preserving forage quality	22	2	24
	- increased use of crop rotations (including forage)	19	5	24
	- improved range and pasture management practises	24	0	24
	- reduction losses due to bloat	15	8	23
A 5	Optimization of lean cattle production			
	- cross breeding	21	3	24
	- feeding and slaughtering bulls	15	8	23
A18	Further rationalization of packing plants will take place			
	- mechanization of unloading and loading of beef carcasses	19	5	24
	- laser cutting of beef cuts	15	8	23
	- automated processing with possibility of use of robotics	15	9	24
	- increasing plant size	12	11	23
	- trend to locate plants in rural areas	8	17	25
	- trend to large multipurpose slaughtering facilities	11	13	24
	- development of a use for paunch residue	16	8	24
	- development of a system to extract major portion of organic matter from waste water	15	8	23
	- lowering of stress impact on beasts to be slaughtered	22	2	24
	- universal plant identification systems for live cattle to link up grade information with farm of origin	19	5	24

Continued...

Appendix F. (The Evaluation of Factors of Change; Continued)

(1)	(2)	(3)	(4)	(5)
A19	Development of an objective method for determining carcass value			
	- electronic grading	22	3	25
	- changes in grading system leading to fuller description of carcass	20	4	24
	- new methods of measuring tenderness	20	5	25
A20	Changes in processing techniques			
	- more fat trimmed at processing level	24	3	27
	- increase in centralized cutting	25	2	27
	- aging primal and subprimal cuts in vacuum packages	24	2	26
	- new tenderization techniques	21	6	27
	- increased use of restructured products	22	5	27
	- resolving the problem of maintaining attractive colors of meat	23	2	25
	- increase in frozen beef products (improvement of technology of keeping fresh appearance)	21	6	27
	- extensive deboning of beef products (more muscle cutting)	25	2	27
	- elimination of dark cutter	19	8	27
A21	Changes in product design and packaging			
	- small servings	26	2	28
	- convenience: "easy to prepare", "easy to eat"	25	2	27
	- extended shelf life (e.g. vacuum packaging)	28	0	28
	- a "healthier" leaner product	24	2	26
	- improved appearance and consumer appeal	25	2	27
	- increased marketing of premium and low grade cuts, less availability of intermediate cuts	16	12	28
	- increase in specialty meats and in variety of products	27	1	28
	- more uniformity (taking less shelf space)	20	8	28
	- name branding of beef products	22	5	27
	- labeling of beef products with nutritional information and cooking ideas	24	3	27
A22	Electronic scanning will be used widely			
	- to measure actual yield and efficiency (by processors)	18	5	23
	- to identify marketing patterns, shrinks, losses (by retailers)	18	6	24
A30	Further increase in the quantity of beef from Western Canada sold in Pacific North-West of USA			
	- transportation cost relation between West-East and North-South	22	1	23
	- reduced ground water in Texas and other adjacent states resulting in a shift of the U.S. feedlots back to Mid-West	11	10	21
A50	Increased competitiveness of beef will occur			
	- increased consumer consciousness regarding drug and chemical residues in consumer meat (especially poultry and pork)	20	6	26
	- animal rights people will succeed in limiting or banning the intensive production of meat, especially poultry and hogs	4	22	26
	- acceptance of yellow fat by consumers	8	17	25
	- more improvement potential for beef than for other meats which have already made use of most new technology available to them	18	8	26

Appendix G

The Summary of Round III Evaluation Process

Appendix G. The Summary of the Third Round Evaluation Process, Alberta, 1987

CODE	IMPORTANCE RATING			VALIDITY RATING		
	Median	Q value	Resp.	Median	Q value	Resp.
(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
TECHNOLOGICAL CHANGES:						
A 5	4.17	0.80	28	3.95	0.80	28
A 9	3.41	1.25	28	3.32	1.24	28
A10	3.50	1.28	28	3.43	1.15	28
A11	3.20	1.19	26	3.12	1.14	26
A13	3.27	1.60	27	2.82	1.29	26
A14	3.11	1.53	27	2.65	1.19	27
A15	4.04	1.07	28	3.75	1.06	28
A22	4.10	0.98	30	4.00	1.25	30
A25	3.00	0.98	29	2.63	1.32	29
INTERNATIONAL CONSIDERATIONS:						
A26	4.47	0.93	28	3.22	1.16	28
A27	4.58	0.82	27	3.15	1.51	27
A28	4.50	0.75	28	3.83	0.86	28
A29	4.14	0.97	28	3.68	1.11	28
A31	4.11	1.50	26	2.93	0.98	26
A32	4.05	1.17	27	2.85	1.45	27
A33	4.48	0.83	27	3.61	1.13	27
A34	4.23	0.95	27	3.39	1.11	27
A35	4.50	1.25	28	3.17	1.08	28
A36	3.78	1.09	28	3.09	0.82	28

Continued...

Appendix G. (Importance and Validity Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
GENERAL ASSUMPTIONS:						
A39	3.68	1.32	28	2.82	1.00	29
A40	3.81	1.08	29	3.11	0.75	29
A41	3.72	1.16	28	2.83	1.11	29
A42	3.75	1.13	27	3.13	0.74	28
A43	3.61	1.22	27	2.72	1.08	28
A50	4.33	0.85	28	3.83	0.86	28
A51	3.03	0.87	26	3.00	1.09	27
A52	3.07	0.98	26	2.74	0.94	26
A53	3.71	1.09	26	2.67	1.10	27
A54	3.69	1.19	28	2.69	1.12	28
A55	3.66	1.36	28	2.57	1.57	29
A57	3.89	0.78	28	3.57	1.38	28
A58	3.66	1.30	28	2.59	1.11	29
A59	3.70	1.51	27	2.91	0.82	28
A60	3.66	1.14	27	3.59	1.33	28
A62	4.54	0.77	28	3.72	1.16	28
A64	3.35	1.49	27	2.94	1.80	28
A65	4.04	0.96	27	3.31	1.45	28
A67	4.29	0.93	30	3.93	0.52	30

Continued...

Appendix G. (Importance and Validity Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
A70	3.08	1.82	28	2.32	1.66	28
A71	3.50	1.27	28	3.00	0.96	29
A72	3.89	1.07	28	3.99	1.19	29
A76	3.78	1.29	29	2.43	1.43	30
SPECIFIC ASSUMPTIONS I:						
B 1	4.14	0.86	30	3.65	1.28	30
B 3	3.25	1.09	28	2.82	1.03	28
B 5	3.88	0.87	28	2.85	1.46	29
B 6	3.93	0.73	28	3.34	1.41	29
B10	3.87	0.95	28	3.81	1.32	28
SPECIFIC ASSUMPTIONS II:						
C 3	3.97	0.74	28	3.81	0.94	29
C 4	3.93	0.73	28	3.15	0.99	29
C 5	4.01	0.71	28	3.21	1.32	29
C 8	3.79	1.01	28	2.96	0.93	28
C 9	4.06	0.78	28	3.72	1.09	29
C10	3.92	0.58	28	3.41	1.16	28
C13	3.93	0.73	28	3.08	1.24	28
C14	3.57	1.20	28	3.21	1.24	29

Continued...

Appendix G. (Importance and Validity Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
SPECIFIC ASSUMPTIONS III:						
D 1	3.86	0.78	27	3.63	1.31	28
D 2	3.50	1.04	26	3.23	1.19	27
D 6	3.73	1.08	27	3.17	1.25	27
D 7	3.05	1.22	27	3.05	0.93	27
D 8	2.99	0.79	27	2.90	0.72	27
D 9	3.61	1.00	27	3.26	1.28	27
D10	3.14	1.20	27	3.09	1.32	27
D12	3.71	1.06	27	3.39	1.27	28
D13	3.64	1.37	27	3.17	1.02	28
D18	3.62	1.18	27	3.20	1.19	28
D19	3.48	1.07	27	2.74	1.14	28
D20	3.00	1.09	27	2.20	1.02	27

Appendix G. The Summary of the Third Round Evaluation Process (Continued), Alberta, 1986

CODE	DESIRABILITY RATING			FEASIBILITY RATING		
(1)	Median (2a)	Q value (2b)	Resp. (2c)	Median (3a)	Q value (3b)	Resp. (3c)
GOVERNMENT PROGRAMS:						
E 1	4.39	0.89	29	3.66	1.23	29
E 2	4.65	0.44	29	3.81	1.15	29
E 5	2.91	1.79	27	3.34	1.35	27
E 7	3.70	1.39	27	3.91	1.33	27
E11	1.83	0.93	27	2.82	1.33	27
E13	3.04	1.09	26	2.89	1.19	27
E14	4.05	1.17	27	3.55	1.36	27
E15	4.14	1.05	27	3.78	1.22	28
E16	2.56	1.44	27	3.14	1.24	26
E19	2.50	1.74	26	2.50	1.25	26
E21	4.40	0.84	27	3.62	1.37	27
E22	3.11	1.57	27	3.18	1.25	27
E23	2.69	1.24	26	2.69	1.30	26
E24	4.10	0.96	27	3.75	1.19	27
E25	4.21	0.96	25	3.50	1.20	26
E26	4.24	1.08	28	3.80	1.01	28

Continued...

Appendix G. (Desirability and Feasibility Ratings; Continued)

(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
E27	3.28	1.47	27	3.26	1.35	27
E28	3.78	1.49	28	3.59	1.28	28
E29	4.04	0.93	28	3.70	1.19	28
E31	3.39	1.39	28	3.14	1.24	27
E32	2.68	1.38	28	2.62	1.29	29
E34	4.28	0.84	29	3.73	1.17	29
E35	2.82	1.92	29	2.13	0.86	30
E36	4.28	0.84	29	3.67	1.17	29
E38	4.40	0.80	29	3.89	0.75	29
E45	4.35	0.91	28	3.65	1.26	28
E50	4.24	1.08	28	3.60	1.50	28